SCORBUTUS
its
Pathology
and
Treatment.
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Among the many diseases which come under the cognizance of the physician, there is no one he can treat with more satisfaction, or with greater certainty of success, provided he have the requisite means at his disposal, than that of scurvy — a disease, not only interesting to the physician on account of his being occasionally called upon to treat it, but, of vast importance to the community at large, seeing that, at various periods our armies and fleets have succumbed to its ravages, and our sturdy seamen have been bent beneath its sweeping force. It is not my intention to enter minutely into the history of scurvy,
further than to state, that it is a disease of no modern origin, and although little mention is made of it by the early writers on medicine, it must have been a companion of wars and famine in all ages.

Hippocrates in his writings gives some indications of such a disease as scurvy existing in his time, but authors are not agreed as to whether the symptoms of the disease mentioned by Hippocrates were so conclusive as to justify its identity with the scurvy of modern times. Pliny seems also to have hinted at it, but attributes its origin to a most unlikely cause. In more recent periods however, the disease, although apparently not well understood, occupied a most prominent position in medical pathology, and the term scurvy served as a convenient epithet for all diseases the nature of which, if
...most physicians did not thoroughly understand. In short, about the commencement of the seventeenth century, almost all the diseases then recognised, were grouped together under the term scurvy. Some physicians seem to have had a very superstitious idea of the cause of scurvy, in the more limited acceptance of the term, during the above mentioned period; some attributing it to the Machinations of the Infernal Deceiver, others to Merited Divine Retribution. That such absurd notions should possess the unlettered, and superstitious, of a country, in that age of Witches & Ghosts, is not to be wondered at; and indeed, a man in the glowing vigour of manhood, to be incised by lacerate his strength and healthy aspect, at the same time, his breath assuming a fetid
down, together with patches of sus-
picious hue disclosing themselves on
various parts of his body, and all
without an apparent cause, might
well be calculated to suggest some
thing of the supernatural, to a
physician not altogether untainted
with the superstition of the age.
Be that as it may; we are told
that previous to the seventeenth
Century, Scurvy was a most con-
mmon disease among the inhab-

tants of Northern Europe.
The civilization and its accom-
paing luxuries extended to
wards the Far North; however, men
began to bestow more care on the
Cultivation of the soil; and to
trust more to the produce of the
Earth for their livelihood, than to
the primitive and precarious
method of obtaining their food, by
hunting and fishing, to which measure
the Inhabitants of the more Northern
regions of our globe are still necessitated to resort. Such an improvement in the manner of obtaining food was not without its beneficial results, for, scarcity, formerly so common, became very rare, and was scarcely to be met with on land, except in the case of troops under unfavourable circumstances, and the inhabitants of besieged towns, when their provisions failed them.

While thus the inhabitants of the land were being rid of such a depopulating disease, those leading a seafaring life were not destined to obtain so early the same exemption; the very advance of civilization, as it increased the knowledge of our forefathers, so did it stimulate their adventurous spirit. They accordingly undertook long voyages of exploration and discovery; and, as they paid no great attention
Linda is the Sunny, 1972, p. 445.
to the proper victualling of their ships, also, not being well skilled in the method of preserving provisions, the disease, which while they were not venturesous enough to lose sight of land, scarcely or not at all existed, now manifest itself in a very unmistakable form, thousands or thousands of our seamen fell victims to it; by it our navies were depopulated, and fleets sent to accomplish some important object, were forced to retire before its irresistible approach or gained their point at an immense sacrifice of human life. Lord Anson says, "The havoc which this dreadful calamity made in those ships was truly surprising. The Centurion, from her leaving England, when at this island, had buried 292 men and had but 114 remaining of her complement. The Gloucester out of a smaller complement
burned the same number and had only 82 alive." Sir Richard Hawkins states, that, "he was able in the course of twenty years, in which he had been employed at sea, to give an account of 10,000 mariners destroyed by it." Such a state of matters continued for some considerable period, but, as attention began to be paid to the proper provisioning of ships, and as proper diets were instituted, scurvy declined rapidly, so that now, in the British Navy, it is a disease almost unknown, some purgatives having been in use for years without having been a case of it. Having thus given a very cursory sketch of the history of scurvy, I shall now devote a little time to the consideration of the disease itself; and, for the sake of convenience, shall treat of it under the following heads.
I. The symptoms and post-mortem appearances.

II. The principal alleged causes of Scurvy.

III. The dietetic and medicinal treatment.

I. Symptoms. The symptoms of advanced Scurvy are obvious enough, and are pretty much alike in most cases; at the commencement or during the "chlorotic stage" however, the symptoms are apt to be confused with those of other cachetic conditions; but an inquiry into the history of the patient, and a consideration of the circumstances of the case, will in general suffice to distinguish Scurvy in its first stage, from diseases of an analogous nature.

At the outset of the disease, the countenance loses its healthy flow and becomes of a pale, dusky or
waxy hue; the lining membrane of
the mouth has a pallid, sickly ap-
pearance, and there is marked feta-
of breath. Should salivation ac-
company this last symptom, as
it sometimes does, the patient has
much the appearance of one labour-
ing under the influence of Mercury.
The first case of Scurvy I had the
opportunity of observing was of this
sort, and so completely was I de-
ceived, that I commenced to treat the
case as one of Mercurialism. The
patient complains of lassitude and
general weakness; is easily fatigued,
and disinclined for any sort of
exercise. As the disease advances,
the countenance assumes a more
ghastly aspect; the gums are bul-
low, spongy & sore; the pale hue
is displaced by a dark livid col-
our. Often, before the gums are in
this manner affected, a livid patch
may be observed on the hard pal-

ate; probably resulting from the pressure of the food during mastication; this appearance is the more readily produced if biscuit formed part of the diet. Pains are now complained of, especially in the large joints of the inferior extremities. This has been called the "rheumatic stage," and certainly, the symptoms have been mistaken for those of rheumatism. I saw a scoliotic patient in the Royal Infirmary last summer, who, previous to admission, had bad laches and blisters applied to his knees; his case having been mistaken for rheumatism. The limbs became redematous and stiff; sometimes both the lower limbs are thus affected, at other times only one. I have seen cases where the legs were pulled to nearly twice their natural size; others in which only one leg was affected, the other remaining
apparently natural. Purple patches now make their appearance on various parts of the body, especially on the lower extremities, and the parts most subjected to pressure or blows; and one of the same colour are often found surrounding the hairs of the legs. The gums are sloughy, and bleed on the least pressure. Occasionally cases of leucy occur, in which, although in an advanced stage, indolent patches do not present themselves on the surface of the body; in other cases a single patch may alone be detected. I recollect of a case in which the only external evidence of leucy besides pallor of face, was the existence of a large purple patch over the right malar bone; the gums however were much affected, and the breath had a fetid odour. In another case there was fatal hematemesis, and no
appearance whatever of extravasated blood into or beneath the deniscence; the gums were in a sloughy condition. Hematemesis, to a greater or less extent, is not of very rare occurrence at this period of the disease; the escape of blood along with the stools also, sometimes occurs, and, should there be much intestinal irritation existing at the same time, might suggest the idea of dysentery, to one not well acquainted with hectic. By the time the disease has advanced thus far, the patient has a most pitiable and cadaverous appearance; his breathing is short and hurried; the least exertion excites palpitation; the purple patches sought at various parts, and foul ulcers disclose themselves, which from assume a fungoid character, known by the name of "bullocks liver". The most favourite site of these ulcers, is over the shins
and there, the bones are very liable
to be affected, in account of their
proximity to the surface. Cases
are related by Dr. Lind and others,
in which pyrexia occurred on as-
suming the erect posture; and we
are even told, that death has re-
sulted in the attempt to get out of
bed. In those who have been wounded
at a previous period, the wounds have
a tendency to open up afresh; in such
cases, I should suppose, that the wounds
were not long healed, and that the
new material was not thoroughly con-
solidated. In the young also, the
epiphyses have been found separated
from the parent bone.

The blood in scorbutic patients dif-
fers from ordinary healthy blood. It has
not the same consistence. It is more
watery + the yellow corpuscles are
deficient in number; this probably
accounts for the great pallor of surface
and indeed, of the whole soft parts
Monthly Medical Journal, July and August, 1847.
of the body generally. In advanced cases too, the corpuscles are altered in shape. Dr. Ritchie states that he found the blood corpuscles more irregular in their outline, more flattened in their discs and more disposed to cohere with one another, and aggregate into large insalubrious masses, than those of young healthy blood. Some maintain that the fibrine of the blood is increased during the phlegmatic stage; but this is doubtful, as there may be some fallacy in determining the exact amount of fibrine, on account of the white corpuscles being entangled among the fibrine, and therefore included along with it.

During the progress of the disease the bowels have in general a tendency to constipation, or more rarely diarrhea may accompany. In the whole however, the bowels are not so much deranged, as one would expect from the character of the
disease. The tongue is pretty clean and moist, but has a pale, leaden appearance. The appetite remains weakfully, and the man may die before the disease has advanced to any great extent, from extravasation of blood into the important viscera, as the brain and lungs; or death may be the result of hemorrhage from the mucous surfaces; and finally the patient may die of pure asthenia.

Post-mortem appearances. The post-mortem appearances presented by a prostrated subject, are such as the symptoms during life would lead one to suspect. Purple patches of ecchymosed blood are found scattered along the walls of the intestines, and occasionally, superficial ulcerations of the mucous coat. The bile is often found to be of a more yellow hue than in health. The heart is pale and flabby; extravasated blood is often found in the lungs,
Brain and other important viscera.

Clots of blood have been found between the bones and periosteum, especially if the dependent parts of the body; the muscles generally, are pale and easily lacerated. The mucous membranes, where not occupied by extravasated blood, have a very pale aspect, contrasting strongly with the contiguous lividity. Extravasated blood is almost always found in the deme, and cellular tissues beneath the deme, also often in the cellular tissue between the muscles, especially those of the inferior extremities, which, together with the serous effusion, is sufficient to account for the pain and stiffness of the limbs.

In a word," says Dr. Laid," the true scarlatine state, in an advanced stage of the disease, seems to consist in numerous effusions of blood into most parts of the body, especial...
I.

The principal alleged causes of scurvy.

Many and various have been the opinions of physicians regarding the cause of scurvy. In early times, before the subject was well understood, its occurrence was attributed more to atmospheric agency, than to dietetic errors; and doubtless, such a view of the matter is as reasonable, as that which would refer the occurrence of scurvy to deficiency or absence of any single nutrient element, without the co-operation of atmospheric influence at all.

Dr. Lind considers that the chief cause of scurvy is the continuance...
If a damp, moist atmosphere, and that a want of fresh succulent vegetables is the occasional cause.
Dr. Budd believes the cause of scurvy to be the want of fresh succulent vegetables.
Dr. Christians attributes it principally to a deficient supply of ascorbic acid; animal principles.
Dr. Garrod informs us that the cause of scurvy is a deficiency of potash.
Of all these views of the cause of scurvy, that which holds it to be a want of fresh succulent vegetables has obtained most credit. I hope to be able to show however, that a want of fresh succulent vegetables will not account for the occurrence of all cases of scurvy, and that persons may and do subsist on diets containing no succulent vegetables, without being affected with scurvy. In treating of the alleged
Lind on the Scurvy, 1792,
Budd, Library of medicine, Art. Scurvy.
Causes of Scurvy. I shall take into consideration:

1st. The effects of cold, impure air, and moisture, and despondency as predisposing causes.

2nd. The merits of, want of fresh succulent vegetables, a deficiency of Potash, and lastly, food deficient in amount and variety, considered as exciting causes of the disease.

(a) Of cold. That cold of itself is capable of giving rise to scurvy, no one now a days would presume to maintain; but, that cold may act indirectly, and on that account be entitled to rank as a predisposing cause of scurvy. I think facts are sufficiently numerous to prove. We read in various authors that scurvy has prevailed most extensively in Northern latitudes—that it was even endemic in the Northern parts of Europe so late as the seventeenth century. Some have supposed this to be owing to the
penscity of succulent vegetables in cold regions; and indeed, did all cases of scurvy depend upon a want of succulent vegetables, such no doubt would be a very plausible explanation. There is however, another method of explaining the matter, and that is, by referring the greater prevalence of scurvy in cold than in warm countries, to the indirect action of cold. How does it act? It is a well known fact, that the colder the atmosphere, the greater is the radiation of heat from the body. And to maintain the animal heat at a proper standard, notwithstanding the increased radiation, it is necessary that there be greater muscular activity and an increased amount of food, digested as well as non-digested, consumed; the digested food to support the system during increased exertion, and the non-digested to yield more fuel for combustion. This is proved by the fact, that a healthy man cou-
James more food in winter than in summer, and that his appetite is greater for fat animal food in cold, than in warm weather. Now, we find that scurvy occurred chiefly during the Winter and Spring months; taking this into account therefore, and also the precarious method the early inhabitants of Northern Europe had of obtaining a livelihood, I think it reasonable to conclude, that, while during the Summer months they could by hunting, fishing, and other means procure food sufficient to preserve them in rigorous health—when the Winter arrived, and their means of obtaining food became limited, or their Winter’s stores were scanty, the supply not being sufficient to meet the demand of the system, to enable it to support the dire amount of animal heat; the unanalyzed and unrecognized principles, proper to the body itself, would be preyed upon, so as
to effect that purpose, and thus the body would be imperfectly nourished. That as the Winter passed away and the Summer advanced, the same amount of food would not be requisite, and opportunity would be afforded for procuring fresh supplies of food, and thus the vigour of body restored. It seems plain therefore, that if cold necessitates the consumption of a larger amount of food, that if through poverty, or other causes, the increased amount of food cannot be afforded, the body will be imperfectly nourished. This condition of the system, accompanied with imperfect aeration of the blood, will strongly favour the development of decay.

(b) Impure air and moisture. To me will doubt the great power of impure air possesses as a predisposing cause of disease. Its influence may be recognised in the pale countenances of
Those much confined, although otherwise pretty healthy. Its effect is great on the blood and secretions. As the function of respiration is imperfectly performed, and the eliminating organs do not act properly, the blood is insufficiently oxidated, and imperfectly freed of impurities. Impure air weakens the appetite, debilitates the system, diminishes nervous energy, and blunts the perception. Contrast the fresh appearance of a healthy man living in the country, where abundance of oxygen affords the lungs free scope for the proper performance of their function, and an unconfined atmosphere permits of ready rent to the cutaneous excretions —with the pallid looks of a confined inhabitant, in an ill ventilated habitat, of a densely populated city and the inference will not be unjust, that impure air has a very deteriorating influence on the system.
predisposing it to many diseases, and
to scurvy not the least. Some writ-
ers on scurvy deny that impure air
has any influence in the production
of that disease, Dr. Budd says, It
has been supposed, too, that the air
of ships, impure from defective vent-
ilation and want of cleanliness, has
had some share in bringing on scurvy.
But there is reason to believe that
the opinion is as unfounded as those
we have already discussed. He then
brings forward as a proof, the fact,
that scurvy does not prevail in the
most densely populated and filthy
parts of the Metropolis. Now, to as-
pert that because scurvy does not
prevail in the most populated and
filthy parts of London, impure air
has no share in the bringing on
of scurvy, is, I think, going a little
too far; for, if impure air predis-
poses to diseases of debility generally,
I see no reason why scurvy should
be excluded. Again, the fact that scurvy does not prevail in the most densely populated and filthy parts of the Metropolis, does not prove that impure air may not have a share in the production of scurvy; but merely, that impure air is of itself incapable of giving rise to that disease; and doubtless, were the inhabitants of these filthy parts of London subjected to an insufficient diet, scurvy would make its appearance among them. Perhaps it might be brought forward as a proof against impure air having any influence in the production of scurvy, the fact of our Crimean army being attacked with scurvy, although occupying tents, and fully exposed to the cold dry wind from the steppes of Siberia; circumstances quite inconsistent with the idea of impure air lurking about.

Did our Crimean Army actually
enjoy pure air? Can men inspiring the fetid emanations from thousands of half burned carcases be said to breathe pure air? Can men exposed to the obnoxious effluvium of numerous latrines, surrounding and even in the centre of a camp, be said to live in a pure atmosphere? Can men huddled together in small tents and damp huts, with every crevice plugged up, so as to exclude the cold, or rather confine the heat, be said to breathe pure air? No - our soldiers were opposed to impure air during the Winter of 1854-5 while in the Crimea; and doubtless, this together with insufficient food were the means of producing scurvy during that period. Again, during the Winter of 1855-6 a severe epidemic of scurvy broke out in the Turkish Contingent to which I was at that period attached while garrisoning Kutch. The disease
made its appearance about the begin-
ning of January 1856 and lasted
until the end of April of the same
year. During the stay of the Con-
tingent at Herat, I had opportu-
nity of observing the condition of
the troops as regards accommodation and
ventilation. The Turks, as is well
known, have long since lost that
interposing spirit which once caused
Europe to tremble, and are now, upon
the whole, an indolent race. The
troops constituting the Contingent
were not exceptions to the gener-
ality of their Countrymen, and did
not exert themselves much, unless,
when the alarm of an approaching
enemy forced them to do so, or the
pursuing of fortifications necessitated their
assistance. They were also very filthy
in their habits; for they converted many
of the draw wells into receptacles of their
excrements, and some of them even
made water closets of the porches at the
entrance of their abodes; circumstances amply sufficient to deteriorate the surrounding atmosphere. As the stones of all the houses not absolutely required as quarters, were necessary to the rearing of the fortifications, the soldiers were much crowded together, and, as the cold was very severe, every crevice which would admit fresh air was stopped; so that the only means of ventilation was the occasional opening of the door, and the current which a burning chafffer in the centre of the room would create. There can be little doubt, therefore, that the impure air these men breathed, had a share in the production of the scurvy which for a time prevailed so many of them. Impure air there, although of itself incapable of giving rise to scurvy, is, in my opinion, a powerful predisposing cause of that disease.

In regard to moisture. Some maintain that it is the principal cause
I know. "I have more than once," says Dr. Land, remarked, that after great rains, or a continuance of close foggy weather, especially after storms with rain, the scrofulous patients generally grew worse; but found a mitigation of their symptoms and complaints, upon the weather becoming drier and warmer for a few days. And I am certain it will be allowed, by all who have had an opportunity of making observations on this disease at sea, or will attentively consider the situation of seamen there, that the principal and main predisposing cause to it, is a manifest and obvious quality of the air viz. Intensity. We all know the depressing effects of rainy weather on our minds, and the great alteration of the spirits which supervenes on the dissolution, and dispersion of inclement clouds. A weight i
as it were, lifted from the mind; the thoughts are more pleasant, and the spirits are in a more cheerful mood. The appetite improves; the inclination to exercise is increased; there is free rent given to cutaneous transpiration; respiration is more easy, and thus the blood is more completely oxidised. Moisture therefore, although perhaps not the main predisposing cause of scurvy, may be said to have a share in its production; and when combined with impure air, its influence will be all the more powerful.

(c) Despondency. Depression of spirits from such causes as, disappointment, defeat in battle, the prospect of a gloomy future and such like, has a very unfavorable influence on the health of persons and predisposes to many of those diseases characterised by debility. In the production of scurvy, de-
pressure of spirits, from whatever cause, exerts a powerful influence. We see this well exemplified in the case of opposed armies, where, so long as victory accompanies the courage of the soldiers exalted, the hopes strong and the prospects good, no enemy shows itself, even although the provisions be scanty and part of the most digestible description. But as soon as defeat is sustained, and with defeat courage dimmed, hopes blighted, and prospects frustrated, scurvy shows itself, and extend its ravages with an alarming rapidity, affecting most especially those who are most depending. For, while success attended them, they were active and cheerful; under these circumstances, perspiration was vigorous, the secretions healthy and thus the blood was maintained pure, and at the same time well aerated; conditions innocuous to the advance of scurvy. But, as soon as reverse occurred, de-
Find on the Scary p. 441
spondency followed, and despondency generated slow movements, slow movements in their turn induce languid perspiration and circulation, these occasion a faulty elimination of the secretions and excretions, and a depraved condition of the blood is the result. This impure state of the blood, assisted by an impure atmosphere and defective nourishment, will most certainly invite an attack of scurvy. "Indeed it was most remarkable," says the narrator of Lord Anson's voyage, "in all our reiterated experience of this malady, that whatever discouraged our people, or at any time dampened their hopes, never failed to add new persons to the distemper — so that it seemed, as if alacrity of mind, and pensive thoughts, were no contemptible preservatives from its fatal malignity." The powerful influence despondency has in inducing and maintaining the hectic state, is
Line on the scurry p. 343.
also well observed in the case of be-
sieged cities. We have a notable ex-
ample in the siege of Breda. "Now
for the passions," says Hyde, "and dis-
positions of the mind contribute to
the production and cure of diseases,
and how much their symptoms and
appearances are diversified by dif-
ferent seasons and by different food,
no where more clearly appeared than
in the siege of Breda. We here
saw the progress of the plague, fever,
and such like diseases, increased
upon the report - spread of bad news,
but in a manner altogether checked
by the arrival of joyful tidings."
I remember well, that during the
last winter of the Crimean Campaign,
while the Turkish soldiers were
kept active, on account of the frequent
alarms raised, by rumors of the
approach of the Russians, and
while they had the prospect of com-
ing to close quarters with the en-
any, the number of sick was small, and no symptoms of scurvy showed themselves. But when they discovered that the rumours were unfounded, and that nothing in the way of fighting was to be expected, the hospital lists began to swell, and symptoms of scurvy made their appearance. As fishing in this occurrence, there was the circumstance, that the soldiers composing the Contingent were men of advanced age, had previously served their time as regular soldiers, and had for the most part wives and children at home. They were likewise under the impression, that although the war ceased, they would still have to serve for a period under the British. Nothing could exceed the alteration which occurred on the arrival at Kelch of the intelligence that peace had been concluded, that the Contingent was to be disbanded, and that the soldiers were to be al-
Find in the Survey, p. 399.
owed to return to their homes. The hos-
pitals, filled with scorbutic and other
patients, became in a short space of
time almost empty, and in the
Artillery hospital, there was not a sin-
gle patient for at least a fortnight
previous to the embarkation for
Constantinople.

Having thus gone over what may be
called the predisposing causes of scurvy,
I shall now take into consideration
the merits of want of fresh succu-
culent vegetables, deficiency of meat,
and lastly, food deficient in amount
and variety, as exciting causes

(a) Of want of fresh succulent veg-
   etables. Many writers both ancient
   and recent hold that this is the
   essential cause of scurvy, and some
   even maintain, that a want of fresh
   succulent vegetables is the sole cause
   of scurvy. "From want of proper at-
   tention to the history of the scurvy"
says Bachstrom, "its causes have

Monthly medical journal, August 1847.
been generally, though wrongly, supposed to be, cold in northern climates, sea air, the use of salt meats, &c. whereas this evil is solely owing to a total abstinence from fresh vegetable food, and greens, which is alone the true primary cause of scurvy.

Dr. Budd states "that prolonged abstinence from succulent vegetables is necessary for its full development; again," moreover it is easy to see that the disease, depending, as it does, on a single cause, must be identical wherever it occurs.

Dr. Lonsdale states "2. That scurvy originates from an error of diet; as generally believed, the occupation, dwellings, &c., sometimes viewed as collateral causes have little or no influence. 3. That a deficiency of potatoes constitutes the chief error of diet, and is the main cause of the present epidemic, whilst the absence of variety and deficient quantity of"
and hastened the development of scurvy." Now, before we receive as orthodox the opinions of the above mentioned distinguished authorities, we must find out, whether every case of scurvy depends upon a want of succulent vegetables, and whether every person not using succulent vegetables, for a continued period, must fall a victim to scurvy.

Should the succulent vegetable theory not hold good in all cases, the inference will be natural, that a want of fresh succulent vegetables is not the sole cause of scurvy.

Dr. Linn says "It would be tedious to give many instances, they being well known, of ships crews continuing several months at sea, upon their ordinary diet, without any approach of scurvy. — There are known messes, as they are called, of seamen, who have lived, during a whole voyage of three years, in the ships pro-
Monthly Medical Journal, July 1847.
visions, for want of money to purchase better fare, especially greens; and who were so regardless of health as to expend what little money they could procure, in brandy and spirits; so that a few onions or the like, was their whole sea store; and a meal of vegetables was seldom eaten by them, above twice or thrice in a month during the whole voyage, so that although it is a certain and experienced truth, that the use of greens and vegetables is effectual in preventing the disease, and extremely beneficial in the cure; and thus we shall say, that abstinence from them, in certain circumstances, proves the occasional cause of the evil. Dr. Christopher states that even the want of fresh vegetables could not always be assigned as the sole cause of scurvy in these cases. For in several instances of the kind succulent vegetables had not been used for
several years; I have seen three cases of this nature in persons in easy circumstances, who for three or four years past had lived, on account of stomach complaints, on a great measure of meat, fish, bread, tea, and coffee, without potatoes or other succulent vegetables; and yet they did not suffer until the present year. In addition to the evidence of these distinguished authorities, that a person may abstain from succulent vegetables and yet not be affected with scurvy; we know that the inhabitants of the Arctic regions do not see vegetables for the greater part of the year, still they seem to prosper. Did a want of succulent vegetables necessitate the appearance of scurvy, the Laplanders, and other natives of the ice-bound regions of the Earth, would have long since ceased to exist. At the same time, I would not assert that scurvy does not occasionally
occur among the Laplanders. And when it does make its appearance, there is as great, if not a greater, show of reason in attributing the principal cause to a deficient supply of food, than to an abstinence from succulent vegetables, a sort of food they seldom taste. Besides, I have known soldiers affected with scurvy received into the Artillery hospital at Whitchurch, who had been using vegetables, such as, cabbages, turnips and potatoes put in large quantities of course, for some time previous to their admission. Now, supposing that these men had the terrific taint in them previous to their receiving succulent vegetables, why did the use of them not abate the progress of the disease? I would explain it after this fashion. The diet of those men had been deficient in amount previous to receiving the vegetables, the quantity of vegetables allowed did not suffice to raise the diet to the standard require
Quite for an active able bodied man, at the same time, the predisposing causes, cold, impure air, were all removed, and thus the disease advanced unchecked. When these men were admitted into hospital, which was of a comfortable temperature and well ventilated, the attendant influences favouring the continuance of the disease were removed, and thus the way was far paved for the cure. As to the remedial means resorted to—they received no additional vegetables, for the vegetables were scarce being all imported from Constantinople, but they received each 12 oz. of good fresh meat, in addition to their ordinary diet; and under this treatment, they speedily got well. There was an arrival of oranges from Constantinople a few days previous to those men being dismissed from hospital, but I don't think the oranges had any thing to do with the cure, as the men were
almost well before receiving any. After having carefully considered the circumstances under which these men were affected with scurvy, I am convinced, that an actual want of succulent vegetables, is not necessary to the occurrence of scurvy; but that scurvy may make its appearance although succulent vegetables form part of the diet, provided that dietary be otherwise incapable of thoroughly supplying the waste of the tissues, and the adjuvants — impure air, despondency, crowding — accompany. As regards Dr. Lonsdale’s opinion “that a deficiency of potatoes constitutes the chief error of diet, and is the main cause of the present epidemic”. That the deficiency of potatoes was the main cause of scurvy during 1846-7. I think there is little room to doubt, but that potatoes have in themselves any peculiar antiscorbutic virtue, is, I think, questionable. We are not to suppose
that previous to the introduction of pot-
atoes into this country, our forefathers
were continually affected with scurvy;
or that, cactus paribus, the disease
was more prevalent than it has
been since the introduction of pot-
tatoes. Besides, it is well known,
that many families, pretty well
off in the world, for a considerable
period after the failure of the pot-
tato crops, scarcely ever tasted a pot-
tato, the greater part being required
for seed, and yet were not affected
with scurvy. I think it would
not be difficult to account for the
failure of the potato crop giving
rise to the subsequent epidemic of
scurvy after another fashion, than
attributing it to some special or
peculiar anti-corbutilic virtue in the
potatoes themselves. It is a well known
fact, that previous to 1845, potatoes
formed the greater part of the dietary
of the lower classes, more especially
in Ireland and the North of Scotland. Now, if the potatoes were taken away, without an equivalent of bread or some other article of diet being substituted, deficient nourishment would be the result; a state of matters favouring the approach of scurvy. This was exactly the case with the poor of this country; their potatoes, their principal article of diet, were taken from them, they had not the means of obtaining an equivalent of some other article of food, and accordingly, were imperfectly nourished. I think therefore it is not overstretched the argument, to attribute the late epidemic of scurvy in this country, to insufficient nourishment, aided by cold, impure air, crowding, despondency &. and not to the withdrawal of any peculiar antiscorbutic virtue along with the potatoes. We have lastly scriptural authority proving that a person may abstain from succulent vegetables, and
Bible, Daniel, chap I, 11-16,
not only not be affected with scurvy but even improve in bodily condition.

"Then said Daniel to Melzar, whom the prince of the eunuchs had set over Daniel, Michael, and Azariah, prove thy servants, I beseech thee, ten days; and let them give pulse to eat and water to drink. Then let our countenances be looked upon before thee, and the countenance of the children that out of the portion of the king's meat; and as thou seest, deal with thy servants. So he consented to them in this matter and proved them ten days. And at the end of ten days their countenances appeared fairer and fatter in flesh than all the children which did eat the portion of the king's meat. Thus Melzar took away the portion of their meat, and the wine that they should drink; and gave them pulse."

(b.) Deficiency of Potash. "Finding that all the theories of scurvy hitherto
advanced were imperfect," says Dr. Garrod, I was led to examine more minutely the composition of food under the use of which scurvy was capable of occurring, and also of such substances as had been proved beyond doubt to be antiscorbutic, and afterwards to seek for the absence or deficiency of certain normal substances in the blood; and from such examination I was led to the following conclusions:

1. That in all scorbutic diets, Potash exists in much smaller quantities than in those which are capable of maintaining health.

2. That all substances found to act as antiscorbutics contain a large amount of Potash.

3. That in scorbuty the blood is deficient in Potash, and the amount of that substance thrown out by the kidneys less than that which occurs in health.

4. That scorbutic patients will be
cures when Potash is added to their food, the other constituents remaining as before, both in quantity and quality, and without the use of succulent vegetables or milk.

5th. That the theory which ascribes the cause of scurvy to a deficiency of Potash in the food, is also capable of rationally explaining many symptoms of that disease.

The first three of Dr. Garrod's conclusions may be readily enough admitted, at the same time, we must not lose sight of the fact that the scorbutive diet is not deficient in Potash alone, but also in punguinous and combustible principles, as well as other salts besides those of Potash. In a table by Dr. Garrod showing the amount of Potash contained in various articles of food in common use, I find the following:

- 1 oz. of home made bread probably containing potato flour.................0.262 gr.
- 1 oz. oat meal..........................0.054 gr.
1 oz. of raw beef .......................... 0.599 "
1 oz. boiled potato of large size ... 1.875 "
1 fluid oz. of London milk ...... 0.309 "
1 fluid oz. of Lemon juice .......... 0.846 "

Now, according to Dr. Gavard's view of the matter, Lemon juice is a much more powerful antiscorbutic than beef or milk, and potatoes form the most powerful antiscorbutic of all.

Did this hold good, it follows that a person living on a diet which included say 1 lb. of potatoes, would be far less liable to be affected with scurvy than another whose diet contained no potatoes, but as a substitute 3 lbs. of beef or bread, and this, merely because potatoes happen to contain a larger amount of Phthis than either beef or bread. That such would actually be the case, I think there is sufficient room for doubt. Again, in the analyses of the various articles of food, Dr. Gavard shows that oat meal does not contain
the 3/4 part of Potash which potatoes do; and milk, not the 1/4 part. Did the Potash theory hold good therefore, it would follow, that men living entirely on oatmeal and a limited supply of milk, would if necessary fall victims to the ravages of scurvy, for what stomach is capable of receiving so much oatmeal and milk as render them anti-scorbutic? Is this the case? Where can be found a more healthy race of men than the country kinds of the middle and northern parts of Scotland, whose only fare is oatmeal and milk from the one year end to the other. Regarding Z. Cabrode 4th and 5th conclusions, I think it is much to be doubted whether a scorbutic patient could be restored to health by the use of Potash alone. Let us fancy a case. A man is living in one of the back slums of a densely populated town. He
clothing is threadbare. It is the Winter season and he cannot afford a fire. To make his abode as warm as possible he shuts up every crevice which would admit of ventilation. There is a sudden slackness of trade. On this account his spirits are depressed. His "daily gains" are not adequate to yield him a sufficient supply of "daily bread." In his fretful breaths, pallid countenance, bleeding gums, stiff and aching limbs, scurvy insidiously declines itself. He feels so haustred, can work no longer, and betakes himself to his "uneasy pallet." Now I appeal to reason, is it possible that the daily administration of a few grains of Potash, without any dietetic alteration, or removal to an airy hospital, could be sufficient to restore that man to vigorous health? It would be just as rational to suppose that a man turned out of doors
in a cold frosty morning, in a state of nudity, would acquire a convenient degree of warmth on his hat being tendered him. However remarkable the coincidence therefore, of the so called antiscorbutics containing a large amount of Potash, I am inclined to disbelieve that the deficiency of Potash in scorbutee food, has any special influence in the production of scurvy; or that the administration of Potash salts alone, conduces much to the cure of that disease.

(c.) Food deficient in amount and variety. From what I have read concerning scurvy, and from what I have myself seen of that disease, I have come to the conclusion that a dietary deficient in amount and in the proportion of azotized and nonazotized principles, together with an absence of variety, and the combined influence of cold, crowding,
impure, moist air and despondency, will account for all cases of true scurvy. This is sufficiently borne out by facts. Let us take as an instance the exemption from scurvy of our Royal Navy under an improved dietary. Is the absence of scurvy in the Navy to be ascribed to the improved dietary, or the addition of a little lemon juice? I fear that cannot be determined, for as lemon juice began to be added to the diet as a prophylactic, the dietary itself underwent a change for the better. Instead of salted meal, the sailors have preserved meal for the most part, and on that account no prolonged steeping is required. Formerly the older and saltier the meal became, the longer was the steeping in water continued, so as to extract the salt, and doubtless a considerable portion of the nutritive principles of the meal...
was extracted along with it. So much so, that a pound of meat, which had been salted for several months before, would not be so nutritious as the same pound of meat previous to being salted; and this on account of the steeping in water required in order that it might be eatable. In addition to this, the water in which the meat was cooked would be so salt as to prevent its being consumed along with the meat; and this, together with the steeping process, would have the effect of deteriorating the value of the meat very much.

Again there was no variety, and doubtless, the continuous use of salted beef and hard biscuit would not at all tend to keep the seamen appetites whetted. According to this view of the matter, a seaman's diet although sufficient at the commencement of a voyage, would after the lapse of a few months be insuf-
sicient, because if the water in which the meal is steeped, and the water in which it is cooked previous to being eaten, extracting a portion of the nutritious principles, and thus lessening the value of the diet. Accordingly, if previously his diet was just sufficient, it would not now be capable of nourishing him properly under the same amount of exertion; and, other circumstances favouring, scurvy would make its appearance. But now that our British seamen have their dietary the same at the beginning as at the end of a voyage, have a goodly variety of articles in their dietary, and the dietary being sufficient, such an untoward occurrence as scurvy is obviated.

Again, in regard to Millbank Penitentiary and other prisons, Dr. Ball says, "wherever this disease has prevailed, there the diet of the prison-
As, though often abundant in other respects, has contained no potatoes, or only a very small quantity. In several prisons, the occurrence of scurvy has wholly ceased on the addition of a few pounds of potatoes being made to the weekly dietary. Now in this case, the evidence to prove that the potatoes, from some innate, special virtue, cured the disease is incomplete, and for the following reason, that the potatoes were given in addition to the previous diet. To have proved satisfactorily that the potatoes, by some special antiscorbic virtue, removed the disease, the potatoes should have been substituted for their equivalent of some other article of diet. And for the very reason that the potatoes were given in addition, I do not think it unjust to infer that the dietaries were deficient in the amount
of nutritious principles, and that the addition of a few pounds of potatoes a week, was sufficient to bring them up to a proper standard, and thus removed the disease.

Again, we have the failure of the potato crop in 1845, followed by an out-break of scurvy among the poorer classes, who made potatoes the most important article of their diet. In this case, it requires no great stretch of ingenuity to prove that the disease chiefly depended on a deficient supply of food; the more so, when we consider that the poor affected with scurvy in many places were not entirely deprived of potatoes and other vegetables, and that those who had the means of procuring an ample substitute for the potatoes, were not affected with the disease, provided they were previously healthy.

In the case of the general prisons
at Perth D. Chisholm, in a most precise and elaborate paper, proves that the substitution of a certain amount of treacle water for milk, had the effect of producing scurvy, even although vegetables were at the same time used. In this case, the dietary before the alteration was doubtless just sufficient to preserve the body healthy. After the substitution of a comparatively inutritious, for a nutritious article, however, the dietary fell below par, and accordingly, other circumstances favouring the disease developed itself. And what proves that the disease was mainly owing to deficient nourishment, is the fact, that on the milk being restored it disappeared, and that without any other treatment.

The same holds good in the case of our Crimean army; for although the food received by the
troops at home was sufficient to maintain them in a healthy state, still, on being exposed to the vicissitudes of the weather, and subjected to an amount of exertion to which they were not previously accustomed, their food also not being of so good a quality nor so well cooked, and being very little increased in amount, they succumbed to scurvy and other diseases. Previous to the arrival of the Turkish Contingent at Wetzil, a large number of live stock was landed at that place. On the arrival of the troops, they received fresh meat every day; and as long as the fresh provisions lasted, the Turks enjoyed good health, although they received no succulent vegetables. When the fresh store was exhausted, they received salted beef instead. Now a great number of the Turks would not eat the salted beef, being very
Scrupulous regarding their diet, and rather suspicious that the Christians were palming horse flesh, or something worse — pork — on them. The result was, that a great many became affected with scurvy; some regiments having as many as four to six hundred affected at a time; and what goes a great way to prove that this outbreak of scurvy resulted chiefly from deficient nourishment, is the fact that the regiments who made use of the salted beef, had exceedingly few affected with the disease. The daily rations of a Turk were: Hard coarse biscuit 1 lb., meat 12 oz., rice 6 oz., butter 1/2 pound, at fatty material got from the tail of the sheep in Turkey; 2 oz. salt, 6 drams, together with an occasional ration of sugar and tobacco. Now, we can readily conceive why scurvy, under circumstances favouring, should occur under such a dietary minus the meat, and why the addition of a small quantity of suc-
culent vegetables failed to remove the disease, until the full amount of meat was again restored. Another fact which goes to prove that food deficient in amount and variety is the chief cause of scurvy, is, that officers, although exposed to almost the same hardships as the men, and often having the same kind of food with the men, only that food in greater quantity, are rarely affected with the disease. In the whole of the Turkish Contingent, there was only one British officer affected with scurvy, as far as I could learn, and he acquired it by living on bread and butter chiefly. This case is analogous to those of the railway labourers Dr. Christian makes mention of; and doubtless, comes under the head of want of variety.
the indications of treatment are obvious enough. The patient is, if possible, to be removed from all the influences which favour the development of the disease. He is to occupy an airy, well ventilated apartment, of comfortable temperature. If he be able to walk about; daily exercise in the open air should be encouraged. All circumstances calculated to damp his spirits are if possible to be removed. At the same time, the patient is to be put upon a nourishing system of diet. As the appetite in scorbatus generally remains good, and digestion is little impaired, this can easily be accomplished. In cases of advanced scurvy, milk, when obtained in sufficient quantity, has a high character; and when we consider its constitution, containing, as it does, all the elements necessary to the formation of healthy
blood, and that by it alone the young
of all mammalia are for a time nour-
ished, I don't think its efficacy is
overrated. Among the ancient writ-
ers on scurvy, we have the names of
Chamceau, Hoffman, Jersey and others,
leaving testimony to the value of milk
in that disease; and more recently,
it has an able advocate in Dr. Christian,
together with others of no small repute.
In addition to milk, or in case of
milk not being obtained in suf-
ficient quantity, the patient is to
have a good supply of animal food
of various sorts, when this can be af-
forded, together with eggs, garri-
caceous food and the vegetables in
ordinary use, as potatoes, cabbages,
turnips, carrots &c. at the same time,
care must be taken not to cram
down the patient with more food
than he is able comfortably to di-
gest.

As regards the medicinal treatment:
little will be required in this line provided the dietetic plan be properly carried out. Lemon juice is a powerful astringent tonic, and may be given with much benefit, either alone or combined with stimulants. Todd y acidulated with lemon juice, was a favourite remedy in the Turkish contingent; a medical officer was told off every evening to superintend the manuf acturing of it, and the Turks, notwithstanding their sacred antipathy to spirits, enjoyed exceedingly their evening beverage. Oranges, when they can be obtained, have a salutary influence on the disease. In early times, when the causes of scurvy were not so well known as now, drugs were much confused in, and among these Peruvian bark held a prominent position. Warmer employed it in the case of the imperial troops in
Hungary; Ruppre and Hulme recommend it. Dr. Linde says "after trial of many medicines, there are but two I can principally recommend. The first is the bark infused in wine." The other drug he mentions is squill. The bark, on account of its bulk, is apt to disagree with the stomach, but, now that we have its active principle in the shape of guinea, such an objection to its use is obviated. In a few cases I have seen, in which guinea was administered, it seemed certainly to accelerate the cure, and appeared to be equally efficacious with lemon juice. I think therefore that the administration of 1 to 2 grains of the disulphate of guinea twice a day would be useful. Perhaps the citrate of lime and guinea would be a good remedy, but I have never seen it tried.

As to local applications; in the case of fungoid ulcers, the application
If some caustic will be necessary. A good application is hydrochloric or nitric acid. The effect of either of these is to do away with the fungoid character of the ulcers. The after-treatment need be but simple; tepid water dressing medicated or not; and, perhaps, an occasional touch with the nitrate of silver. It will be found, however, that as the system improves so will the ulcers assume a more healthy aspect, and heal kindly. A gargle may be used to improve the condition of the mouth and gums; equal parts of acetic acid and alcohol, diluted with water, will answer the purpose very well. Flickering the gums with nitrate of silver in substance, works a wonderful change and that speedily; it undoes the sloughy condition of the gums and obviates the tendency to bleeding. The pains complained of in the limbs may be alleviated by
Fiction with or without any stimulating sentiment.

George Scott-Davie