sity of Upsala at the age of sixty-six. He was considered the most eminent of Swedish alienist physicians, and it was through him that a rational mode of caring for lunatics was introduced into the asylums. He was honorary President for Sweden of the Section of Psychiatry at the Copenhagen International Medical Congress in 1884. Dr. Amédée Poctevin, Professor of Descriptive Anatomy in Montreal, aged thirty-three.—Dr. Justus Carrière, Extraordinary Professor of Zoology in the University of Strasburg, and a grandson of Liebig, of diphtheria, in his fortieth year.—Professor Benjamin Luzzato, Director of the Medical Clinic, Palermo. He had just finished an important paper on the Circulation.

SEVERAL changes have recently taken place in the teaching staff at St. Bartholomew's Hospital. Dr. Norman Moore has succeeded Dr. Gee as Joint Lecturer on Medicine, and the Lectureship on Pathology, recently held by Dr. Norman Moore, has been entrusted to Dr. Kanthack. Dr. Herringham has been appointed Medical Registrar and Dr. Tooth succeeds Dr. Ormerod as Demonstrator of Morbid Anatomy. In the more scientific subjects changes have also taken place. Mr. F. D. Chattaway, B.A.Oxon., D.Sc.Lond., Ph.D.Munich, has been appointed Demonstrator of Chemistry, and Mr. Alfred Howard has been elected Assistant Demonstrator of Chemistry. Mr. J. S. Edkins, M.A., M.B.Cantab, George Henry Lewes student and late Demonstrator of Physiology at Owens College, Manchester, has been appointed Demonstrator of Physiology.

AN old Act, incorporated in the Public Health (London) Act, requires every sanitary authority to appoint one or more medical officers of health for their district. The Treasurers and masters of the sanitary districts of the Inner Temple and the Middle Temple have appointed Dr. F. J. Waldo, the medical officer of health for the parish of St. George-the-Martyr, Southwark, medical officer of health for their districts. He has received the permission of the Local Government Board and the Vestry of St. George-the-Martyr to retain his present appointment in Southwark in addition to those above-mentioned.

AN addition to Clubland is about be made by the formation of a club for the association in membership of Fellows of the various Royal and learned societies. Membership will be limited exclusively to presidents, members of council, fellows and members of the learned societies at home and abroad, as well as academicians and associates of the Royal Academies and professors of universities. Colonel W. P. Hodnett, late 2nd Dorset (54th) Regiment, is the hon. secretary.

THE Home Secretary has sent a letter to Sir Edmund Lechmere testifying to the excellent work done by the St. John Ambulance Brigade in the streets on the occasion of the Royal Marriage, and desiring him to convey to the members of the brigade the grateful acknowledgment of the police authorities and himself for such services. The force employed consisted of 200 ambulance officers and men, 10 surgeons and 30 nursing sisters, and 1544 cases were relieved.

MR. RICHARD DAVY having resigned his position as one of the surgeons to the Westminster Hospital has been elected a consulting surgeon. Mr. Davy was appointed surgical registrar in 1869, assistant surgeon in 1871 and full surgeon in 1873.

THE Royal Commission on Vaccination held a sitting at its offices in Great George-street, Westminster, on July 26th. Dr. B. A. Whitelegge of Wakefield gave evidence showing the favourable results of vaccination. The Commission adjourned over the Long Vacation.

IT is understood that Lord Brassey has been offered and has accepted the Chairmanship of the Royal Commission on the Opium Traffic.

THE London Counties Medical Protection Society have, we understand, been duly authorised by the Society of Apothecaries to take proceedings against Mr. Alabone in accordance with the suggestions of the Judge in the case of Alabone *v.* Morton.

PROFESSOR A. FRAENKEL, Director of the Urban Hospital, Berlin, has resigned the editorship of the *Centralblatt für Klinische Medicin*. He is succeeded by Professor Unverricht, Magdeburg.

THE LANCET
Special Analytical Sanitary Commission
ON
THE CHARACTER AND QUALITY OF THE ICE-SUPPLY OF LONDON.

AMONGST the new industries that have come into existence during the last decade not the least important is that of the artificial production of ice. Not only has an increase in the output of ice been demanded by certain manufacturing processes—to wit, the brewing of beer, the refining of paraffin, the preparation of pure chemical products and other installations—but what concerns us most in the present inquiry is that ice is also extensively resorted to for the cooling and preservation of articles of food and for mixing with a great number of beverages in which it is melted and actually consumed. The quantity of ice used in this manner has increased enormously during late years, the consumption reaching its maximum in the months of June, July and August. This being so, the quality and character of the ice commonly supplied for the uses just mentioned are matters of extreme and vital importance. Natural ice is plentifully supplied to this country from the immense ice fields of Norway and other countries, and its conveyance to English ports forms no small industry in the shipping world. In spite, moreover, of the invention and introduction of powerful refrigerating machinery for the manufacture of ice, the importation of natural ice still continues. Thus, of the six samples procured for the present inquiry, which, as will be hereafter seen, were fairly taken to represent the ice supply of the metropolis, five were ascertained to be natural ice imported from Norway and only one had been produced artificially. Whether the general substitution of artificial ice for natural ice would effect any change for the better in the quality of the supply remains to be seen, but it has been recorded that natural ice is often contaminated with certain impurities and it has been frequently stated to be plentifully stored with bacteria. We are naturally led to expect, therefore, that the substitution of artificial ice would give greater security to the community against any danger from this source; but disquieting rumours have from time to time been raised as to the origin and source of the water used in the refrigerating process. We have, therefore, been prompted to institute a keen and searching inquiry into this subject with the view of setting at rest the question whether there is any foundation for supposing that the ice of London as generally supplied, whether natural or artificial, is not what it ought to be, or, in other words, is fit or unfit for human consumption. The inquiry is divided into two sections. The first section relates to the chemical analysis of the water resulting from melting the ice and to the indications as to purity thereby afforded, and the second section to the results of a bacteriological examination. Before proceeding to detail the results furnished by both sets of experiments a brief outline of the methods employed for the production of ice artificially will be of interest.

It is well known that heat is absorbed by two processes—firstly, by change of the condition of aggregation and, secondly, by expansion of volume, so that cold may be produced in three ways: (1) By liquefaction of a solid by means of a liquid

(solution of salts in water—e.g., nitrate or sulpho-cyanide of ammonium or chloride of calcium) or of another solid (ice and salt)—that is, by means of freezing mixtures; (2) by converting a liquid body (ether or ammonia, sulphurous acid or carbonic acid) into a gaseous condition; and (3) by the expansion of compressed air. Processes 2 and 3 are employed for the production of ice on a large scale, but the conversion of liquid carbonic acid and sulphurous acid into vapour gives the most satisfactory results. The compression of carbonic acid or a mixture of carbonic acid and sulphurous acid is effected by means of powerful steam force-pumps. During the compressing process heat is, of course, produced and provision for its removal is accordingly made by means of water-jackets. In the case of carbonic or sulphurous acid liquefaction of the gas is the result, and the liquid so obtained, on being allowed to evaporate (to resume its original physical state), takes up the heat that was lost in the compressing operation and produces great cold. In practice this operation takes place in a spiral condenser or worm, between the turns of which iron cells containing pure water are suspended, or the worm may pass through a saturated saline solution, chloride of calcium or brine, which do not freeze in spite of the low temperature to which they are reduced. The brine solution is available for use as a refrigerating medium either by circulating through pipes, as in cooling the cellars or storehouses of a brewery, or by immersing articles placed in a suitable receptacle in the cold saline fluid. The carbonic acid and sulphurous acid, being restored by the evaporation to gas, are returned to the compression pumps again, and so the process is continuous. Air does not liquefy at the greatest pressure attainable by ordinary force pumps, it is simply compressed, cooled and then allowed to resume its original volume, in which operation heat is absorbed and cold is produced. The process is therefore the same in substance as with carbonic acid or sulphurous acid, but the degree of cold attained is, as might be expected, decidedly less.

In order that the ice obtained for the purposes of the present inquiry should be representative of the ice actually supplied to the public for consumption and not merely for the wholesale external cooling of foods or beverages, care was taken to ascertain from the vendors that the samples obtained were chips of the block actually provided for the cooling of drinks by the simple expedient of placing the ice in the liquid itself. We therefore leave out of consideration all question as to the purity of the ice that is used for cooling purposes—such, for example, as for bottled wines or other articles of consumption with which the ice does not come in actual contact. In short the inquiry deals with the character of ice the water resulting from the melting of which is consumed. In this connexion it may be observed that ice is frequently employed to cool the beverage or draught of the invalid sick and that the sucking of ice is often recommended in certain ailments. The importance, therefore, of the supply of a pure commodity becomes doubly emphasised when these facts are taken into consideration.

Of the six samples procured three were obtained from wholesale depôts and three from restaurants. Two of the wholesale depôts were situated in the City area and the remaining one in the West Central district. The restaurants or eating-houses where the other three samples were procured were situated, one in the City, and the other two between the City and Charing-cross. At the latter places we were assured that the ice was the best that could be bought and fit for all purposes, whilst at the depôts we were informed that the ice obtained was identical with that supplied to the principal restaurants of London.

CHEMICAL REPORT.

The chemical analysis of ice simply resolves itself into an examination of the water obtained on melting the solid ice. Every precaution was taken to secure the ice against contamination during the collection of the samples and their conveyance to THE LANCET laboratory. Arrived there the samples were broken into small pieces and thoroughly rinsed with pure distilled water. This done, the pieces were allowed to melt in capacious funnels, by means of which the resulting water was collected in bottles specially cleaned for the purpose. The usual chemical examination, as in the case of potable water, was then made. The results obtained may be recorded and described *seriatim;* the figures express throughout in grains per gallon the quantity of the constituents found:—

Sample 1.—This sample was purchased from a large ice company in the City, and was stated to be artificially produced. To the naked eye it was somewhat opaque in consequence of variation in the structure of the crystal and of the presence of small air cavities, but no objectionable-looking suspended impurity was observed. Analysis gave the following results:—

Free ammonia	0·0196	grains per gallon
Albuminoid ammonia	0·0084	,, ,,
Nitrogen in nitrates	0·0700	,, ,,
Total solids	9·80	,, ,,
,, hardness (permanent) ...	7·73	,, ,,
Chlorine in chlorides	1·75	,, ,,
Oxygen required to oxidise organic matter (three hours)	0·0455	,, ,,

The water obtained from the melting of this specimen contained a considerable sediment, which was perfectly white. Under the microscope it was seen to consist of perfectly regular crystals of chalk ($CaCO_3$), in proof of which it disappeared with effervescence of carbonic acid gas on adding acetic acid. This elimination of chalk in well-defined crystals is of peculiar interest since it has been observed that when water containing common salt is frozen a small fraction of the salt crystallises in cubes in the mass of ice. The same phenomenon would appear, therefore, to take place with carbonate of calcium that is dissolved in the carbonic acid of the water. The freezing process, in fact, removes the permanent hardness of the water just as boiling does. In the case of boiling, however, the carbonic acid is expelled and the chalk ($CaCO_3$) is precipitated. In the other case, that of freezing, it would appear that the chalk assumes a crystalline condition which would seem to prevent its re-solution in the water, although it may contain carbonic acid, unless it is expelled during refrigeration. But the $CaCO_3$ obtained on melting ice for the production of which hard water was used is quite distinct from the $CaCO_3$ obtained on boiling similarly hard water. The microscope also showed patches of iron oxide (Fe_2O_3). The free ammonia in this specimen is, comparatively speaking, considerable, whilst the ammonia liberated by alkaline permanganate is slightly above the recognised standard of purity of potable waters. These results do not constitute *per se* sufficient evidence to condemn the water or the ice on the score of organic impurity, especially when regard is paid to the remaining factors of the analysis. It is well known that water of good quality is obtained from the artesian wells of London at very great depths, but which, nevertheless, yields a notable amount of free ammonia on distillation. It is this fact which prompts us to surmise that the water used for the production of this ice is probably obtained from a London artesian well.

Sample 2.—This was obtained from a firm of large restaurant proprietors in the City; it consisted of natural ice from Norway. The sample was perfectly clear and yielded on melting bright and clear water which contained a slight sediment consisting of oxide of iron and carbonate of lime. The following results were yielded on analysis:—

Free ammonia	Traces.	
Albuminoid ammonia... ...	,,	
Nitrogen in nitrates	0·042	grain per gallon.
Total solids	1·40	,, ,,
Total hardness (permanent)	1·03	,, ,,
Chlorine in chlorides	0·20	,, ,,
Oxygen required to oxidise organic matter...	0·028	,, ,,

This ice was of remarkable purity *from a chemical point of view* and gave, on melting, water of organic quality equal to distilled water. The total solids amounted to a trifle over one grain per gallon, the chlorine to only one-fifth of a grain per gallon, whilst the free ammonia, albuminoid ammonia and oxygen required were so low as to indicate irreproachable quality as regards organic matter.

Sample 3.—This was a sample of Norwegian ice also from a restaurant in the City. It looked quite clear and on melting gave water which was clear and bright and absolutely without sediment:—

Free ammonia	0·0070	grain per gallon.
Albuminoid ammonia	Trace.	
Nitrogen in nitrates	0·014	,, ,,
Total solids	0·700	,, ,,
Total hardness (permanent) ...	0·50	,, ,,
Chlorine in chlorides	0·14	,, ,,
Oxygen required to oxidise organic matter	0·28	,, ,,

Like the last, this sample was probably derived from water nearly as *chemically* pure as distilled water, and it was practically free from solid matter—only 0·7 grain, half a grain

of which was due to sulphate of lime ($CaSO_4$) and one-tenth of a grain to chlorine in chlorides. Though the figure for ammonia was somewhat higher, yet the oxygen required, the nitrogen in nitrates and the albuminoid ammonia would tend to allay any suspicion as to the probability of contamination having taken place. The specimen was as *chemically* pure as could possibly be expected had it been made from distilled water.

Sample 4.—This sample (Norwegian) was purchased from the depôt of a company in the West-end. This ice, we were informed, is largely used in the restaurants of the neighbourhood. It was a clear specimen and afforded water equally clear and bright and without sediment :—

Free ammonia	0·0056	grain per gallon
Albuminoid	Nil.	
Nitrogen in nitrates...	0·028	,, ,,
Total solids	0·70	,, ,,
Total hardness (permanent) ...	0·50	,, ,,
Chlorine in chlorides	0·14	,, ,,
Oxygen required to oxidise organic matter	0·024	,, ,,

The *chemical* analysis, as will be seen, is very satisfactory. There is not the least indication of organic impurity and the ice was doubtless produced from water nearly equal to distilled water in regard to excellence of *chemical* quality.

Sample 5.—This was a Norwegian sample purchased in the West-end. It was quite bright and no suspended particles could be traced in the crystal. The water derived from it contained a very slight sediment, but was otherwise clear and bright. On analysis the following figures were obtained :—

Free ammonia	0 0070	grain per gallon
Albuminoid	0·0028	,, ,,
Nitrogen in nitrates...	0·0560	,, ,,
Total solids	1·4	,, ,,
Total hardness	1·0	,, ,,
Chlorine in chlorides	0·21	,, ,,
Oxygen required to oxidise organic matter	0·021	,, ,,

The composition of the water yielded by this ice closely resembled that of Sample 2; it was probably derived from the same source. It was slightly harder than the previous sample and contained more solid matter, but there is not the least *chemical* evidence to show that the water from which this ice was derived was not pure.

Sample 6.—This sample was obtained at a restaurant in the West Central district and as far as could be ascertained it represented the Norwegian supply. It was quite clear and yielded a bright liquid on melting, which contained a very slight sediment. On analysis it yielded the following results :—

Free ammonia	0·0084	grains per gallon
Albuminoid	0·0028	,, ,,
Nitrogen in nitrates	0·042	,, ,,
Total solids	1·40	,, ,,
Total hardness	1·10	,, ,,
Chlorine in chlorides	0·21	,, ,,
Oxygen required to oxidise organic matter	0·028	,, ,,

It will be seen at once on comparison with the previous analyses that this ice yielded results substantially identical with those of Samples 3 and 5. The free ammonia, however, is slightly higher, but in view of the indications of the remaining factors—more particularly the oxygen absorbed, the chlorine, and the albuminoid ammonia—no importance can be attached to this minute difference. There is little doubt that the water used in producing this ice was free from organic impurity and approached distilled water in chemical character.

General Conclusions on the Quality of the Ice from a Chemical Point of View.

Chemical analysis was at least valuable in deciding one important point in regard to the quality of the samples obtained in the present investigation, and that is that, with the exception of one sample, all were derived from water of a chemical purity approaching that of distilled water. This alone would be a fact, in the light of a purely chemical examination, upon which we could congratulate the public as well as those who are responsible for the supply of ice in London intended for human consumption. But a mere chemical analysis does not afford *per se* conclusive and decided evidence as to the fitness of a water for drinking purposes. A chemical examination may furnish evidence of impurity sufficient to condemn the water in question, but alone it is powerless to decide whether the water may be drunk *with absolute safety*; a water therefore the purity of which is doubted should pass the requirements both of a chemical and bacteriological examination before it can be regarded as fit for human consumption. This is illustrated in an interesting manner in the present inquiry, where some of the samples proved satisfactory *chemically* but unsatisfactory *bacteriologically*. In other words, whilst chemical analysis would have freed them from reproach, bacteriological analysis pronounced on the same samples a condemnatory verdict.

The chemical composition of the sample (No. 1), which is the only specimen of artificial ice, is of interest as indicating the origin of the water used in its production. It was probably derived from an artesian well sunk beneath the London clay; at least its composition leads to this assumption. The results of its chemical analysis, especially in regard to nitrogen constituents, were not entirely satisfactory, but in the absence of information as to its history no definite opinion can be given on this point; suffice it to say, however, that bacteriological examination gave a very satisfactory account of this water. The observation already recorded that the process of refrigeration renders the lime ($CaCO_3$) crystalline in the ice, so that as such it is thrown out of solution when the ice is melted, is of interest and, so far as we know, is an observation placed on record for the first time. A similar observation, but in regard to salt, was, however, made some time ago by Professor Buchanan,[1] who found that sea-water ice contains common salt, not as brine mechanically enclosed in the ice, but in the solid form either as a single crystalline substance or as a mixture of ice and salt.

Bacteriological Report.

Each portion was carefully washed with sterilised warm water and then placed in a sterilised glass vessel carefully protected from the air. After standing for a minute or two it was again washed with sterilised water which was poured off and the ice was then allowed to melt until there was a sufficient quantity of water for the purposes of our experiments. A series of gelatine plate cultures, each containing from ·066 to 1 c.c., was made from each sample, five plates being made in each series. As the weather was extremely warm during the time that these plates were made two from each series were kept in an ice safe in which the temperature was maintained at about 42° F.; the other plates were kept in the usual manner at the temperature of the room. In the one case, where the number of colonies was apparently higher in the plates kept in the ice safe than in those kept at the temperature of the room, the discrepancy is probably to be accounted for by the fact that the liquefying organisms did not spread over the surface so rapidly and thus did not encroach on other colonies and a more accurate enumeration could thus be made.

Table of Results.

Ice.	Plates kept in ice safe. Number of colonies per c.c.	Plates kept at the temperature of the room. Number of colonies per c.c.	Number of species.	——	Percentage of liquefying colonies.
1	0	1-6	1	Non-liquefying: rods.	—
2	400-500	500	6	Liquefying: rods, 2 species; non-liquefying: rods, 3 species; cocci, 1 species.	5
3	600-700	500-600	6	Liquefying: rods, 2 species; cocci, 1 species; non-liquefying: rods, 3 species.	35
4	40	70	3	Liquefying: rods, 1 species; non-liquefying: rods, 1 species; cocci, 1 species.	5
5	26	35	2	Liquefying: rods, 1 species; non-liquefying: rods, 1 species.	50
6	40	50	3	Liquefying: rods, 1 species; non-liquefying: rods, 2 species.	3

[1] Proceedings of the Royal Society, xxii., 431.

GENERAL CONCLUSIONS ON THE QUALITY OF THE ICE FROM A BACTERIOLOGICAL POINT OF VIEW.

In making deductions from a bacteriological analysis of ice-water we must bear in mind that we cannot compare directly the results obtained with those obtained from an ordinary sample of water. We judge of the bacteriological purity of a water by *(a)* the number of organisms that it contains and *(b)* the variety of species present. From these data we are able to gather whether the water has recently come into relation with suspicious surroundings. Inasmuch, however, as not only the number of organisms but even the number of species in water is greatly diminished in the process of freezing, we should require much less evidence in this respect of the probable contamination in the case of ice. Judging the specimens of ice above described by a standard based on the above considerations we should regard No. 1 as a very good sample of pure ice, Nos. 2 and 3 as bad, and Nos. 4, 5 and 6 as of very fair quality.

The outcome of the whole inquiry is as follows:

1. By far the greater proportion of ice supplied in London is natural (generally Norwegian). Of the specimens procured only one had been produced artificially, and this specimen gave indifferent results on chemical analysis, but results of an eminently satisfactory kind in the light of bacteriological inquiry, practically no development of colonies of organisms taking place on culture.

2. Two out of five specimens of ice imported into this country from Norway, whilst yielding a satisfactory chemical analysis, were decidedly bad according to bacteriological examination, the number of colonies of organisms counted on culture varying from 400 to 700 per cubic centimetre of the melted ice.

3. Three out of five specimens of imported ice, though furnishing no condemnatory evidence on chemical examination, yielded bacteriological results such as might under certain circumstances give rise to suspicion, though they may be regarded as of fairly good quality.

In the light of these results it is evident that when ice is intended for human consumption preference should be given to that produced by artificial means; but the water used for this purpose may not be satisfactory, and we would therefore point out the desirability of using only the condensed product of steam (distilled water) for this purpose—a product, be it remarked, that must be free from disease-producing organisms. Natural ice as it is imported, though giving satisfactory results on chemical analysis, is not, in the majority of cases, entirely satisfactory from a bacteriological point of view; but it may be pointed out that a loophole of escape is afforded us by taking advantage of those chemical and physical phenomena in which change of state is concerned in producing extreme cold: we refer to the production of ice artificially, and, bearing in mind the fact that ice is so frequently used in the sick room and for table purposes, we strongly urge that it would be well if the means of obtaining a supply which we have indicated above—viz, the employment of *freshly*-distilled or sterilised water—could be generally adopted.

THE NON-TRANSMISSION OF SMALL-POX BY VACCINE LYMPH.

BY S. MANNINGTON CAFFYN, L.R.C.P. EDIN., M.R.C.S. ENG.,
LATE GOVERNMENT MEDICAL OFFICER FOR NEW SOUTH WALES.

THERE is no argument that the anti-vaccination enthusiast finds more useful in his contest with the obvious than his assertion that it is possible to transmit disease tendencies and hereditary taint through the medium of lymph; and it has occurred to me that a record of an experience that helps to place any such possibility beyond the region of doubt will not be an absolute waste of time.

In the year 1881 I, then in practice at Wollongong, the third seaport of New South Wales, had business that necessitated my running down to Sydney. Business over, I made for the Australian Club in search of lunch and old friends. The first man to welcome me was Dr. Alleyne, who had been for forty years—i.e., since its birth—senior Government medical officer for the colony and had become quite a national institution. Dr. Alleyne was a giant of the old order, eighty years of age, 6 ft. 4 in. in height and as straight as a ram-rod. Greetings over, he removed his hat with a carefulness that did not surprise me, for I knew it to be the receptacle of Government despatches, urgent telegrams, news of ships waiting in the harbour for his sanction to come up and letters marked "urgent," and most of these were unopened. The bottom of that hat was never seen for the simple reason that the first or second letter opened would summon him to some important engagement for the preceding day. In reply to my inquiry as to how life was using him he pointed to his hat and gave a deep grunt of despair, and I, walking to the table, took up and, at his request, opened the first letter that presented itself. It was marked "very important," twice underlined, and it was important to this extent, that the contents cost Dr. Alleyne his life, altered the whole course of mine, upset the business of the colony as much as a civil war could have done and, lastly, resulted in the expenditure of £270,000. And yet the letter was a very brief one. It simply announced the fact that a certain medical man believed that he had discovered amongst his patients a case of confluent small-pox and requested the Government medical officer to see it with him as early as possible. The effect of this letter upon Dr. Alleyne was past describing, and to me, just from London where small-pox was a matter of common occurrence, inexplicable. He raved, stamped the floor and expressed his emotions forcibly. As the weeks flew past us with their ever-increasing rush of work, as public excitement rose to fever heat, and as street after street became deserted because a report was abroad that some child had a pimple on its face, it began to dawn upon me what small-pox meant to this unvaccinated community; but it was not until I wandered back alone from my old friend's funeral that I quite understood all that that letter meant to him. But to resume my narrative. At the urgent request of Dr. Alleyne I saw the case for him. The consultation could not be truthfully spoken of as at the "bedside," for the gentleman under whose care the patient was inspected him through a large lens used for the purpose of examining photographs and exposed one eye only round the corner of the door to the risk of infection. It was confluent small-pox and thenceforth I had charge of the epidemic with orders to stamp it out at any cost. It would be impossible here to give any idea of the extreme measures resorted to. With the help of Dr Higham Hill I burnt down terraces, whitewashed the insides of pianos, carbolised tons of sugar, tea and grocery stores, and sent patients with temperatures of 104° across the harbour to the quarantine station in an open boat and in the middle of the night. It was at the quarantine station that the incident to which I am about to refer occurred. I had in my division of the ground some forty "suspects"—i.e., people who had been removed from infected houses, but not themselves suffering from the disease—and on the second day after my arrival the order came to vaccinate everybody under my care. New South Wales has no law enforcing vaccination, and the whole community may be divided into three classes: a few—very few—who submit to the operation from the belief in its efficacy, the rest being equally divided into two parts—first, the careless, who are unvaccinated because in the fearful hurry of colonial life there has been no time to bother about it, the rest being rampant anti-vaccinationists, cursed with the little knowledge that is the badge of all their tribe. Therefore, when the order was issued for all to be at my hut "by ten to-morrow" that I might vaccinate them, a thrill of excitement and a whisper of mutiny ran through the settlement. In obedience to the first instincts of a young democracy a public meeting was summoned and a shoemaker of great verbosity was invited to the chair; the meeting lasted the whole afternoon, and the direct outcome of it was that a resolution, formally drawn up and signed on behalf of the meeting by the chairman, was presented to me. Of the contents of this document I only remember that it entered very deeply into the scientific inaccuracy of the whole theory of vaccination and the gross interference with the liberty of the subject, and ended with a distinct refusal to submit to the operation. But a threat of prolonged detention and some tact brought about a compromise; after another meeting that lasted well into the night the people consented to be vaccinated if the lymph used was taken from a child who had been brought down the previous day—a fine, healthy child, with a clean skin and of good parentage. To this I consented and on the following day the terrible ordeal was gone through, I including myself amongst those operated upon. The next morning I was sent for very early to see the child from whom the lymph had been taken. I found her