efficient. The following experiments were performed with it, selecting again S. A. and M. S. as the operators.

Experimenter.	Control.	One Foot Distance.	Two Feet Distance.
S.A.	Without a mask 4	25	Overgrown.
	With a mask ... 8	12	"
"	Without a mask 5	10	6
	With a mask ... overgrown	8	Overgrown.
"	Without a mask 2	Overgrown	5
	With a mask ... 5	"	10
M.S.	Without a mask overgrown	"	25
	With a mask ... 24	"	4
"	Without a mask overgrown	"	Overgrown.
	With a mask overgrown	"	"
Self	Without a mask 1	7	1
	With a mask ... 1	5	2
Total	Without a mask 12+2 overgrown	42+3 overgrown	37+2 overgrown.
	With a mask 38+2 overgrown	25+3 overgrown	16+3 overgrown.

The large number of plates which were overgrown somewhat mars the value of the results, yet it is seen that in the total of the cases without a mask there was a marked increase of contamination, while when the mask was worn there was no increase in the contamination of the plates read over beyond that of the control. The experiment without a mask was in each case performed first, hence probably the greater pollution of the controls when the mask was worn.

In regard to the use of gargles, the following was the result obtained by a strong gargle containing carbolic acid, chlorate of potash, and glycerine, on S. A.:

S. A.	Control.	One Foot Distance.	Two Feet Distance.
Before gargle	4	31	2
After gargle	5	28	3

In conclusion, I desire to express my obligations in the first place to Sister Hastie of Ward VII, without whose indefatigable and skilful help I could not have executed these experiments; to Mr. Lionel Colledge for his many valuable suggestions; to Professor O'Sullivan of Dublin University for his kindly aid with the bibliography of the subject; and, finally, to all those who, at considerable personal discomfort, took part in these experiments.

REFERENCES.

- ¹ Vide *Practitioner*, vol. lxxix, No. 413, p. 520. ² BRITISH MEDICAL JOURNAL, July 2nd, 1904. ³ Ibid., June 11th, 1904. ⁴ *Centralblatt für Bacteriologie*, xxiv, Bd. 1903, No. 1. ⁵ Ibid. ⁶ Loc. cit., October 8th, 15th, 20th, 1903. ⁷ *Sterilization of the Hands*, by Mr. Leedham-Green, pp. 65, 72. ⁸ *The Floating Matter of the Air*, by John Tyndall, second edition, p. 117. ⁹ Ibid., p. 51. ¹⁰ *Journal of Hygiene*, vol. 3, No. 4, p. 570. ¹¹ Loc. cit., p. 47.

KERATOSIS PALMARIS ET PLANTARIS IN FIVE GENERATIONS.

BY
F. H. JACOB, M.D. Lond. and ADAM FULTON, M.B., B.Ch., B.A.O., R.U.I.

THERE lives in this town a man, J. W., who suffers from keratosis palmaris et plantaris in a marked degree.

In adjoining houses live three children and three grandchildren who have inherited the condition.

The youngest child affected is twenty months old, and the skin of the palms and soles, instead of being thin, pink, and shiny, is considerably thickened, white, and rough, like ground glass.

In the adults the horny epithelium is about $\frac{1}{8}$ in. thick and almost black. It presents, in lines corresponding to the normal folds of the skin, deep fissures which have at their base apparently normal epithelium and which, therefore, do not get sore, nor crack and bleed, as do those in acquired keratosis.

J. W. gives the following family tradition as to the origin

of the complaint. His great-grandmother, while returning on a troopship from India, was one day looking over the bulwarks and was startled by the unexpected jumping of a large fish out of the water. "A fish, a fish," she cried, and clapped her hands together. The child of which she was then pregnant was born with "fish scales" on its hands and feet, as were also the eleven other children to whom she subsequently gave birth. J. W. remembers his grandmother perfectly well, and vouches for the fact that both she and his mother suffered from this affection.

Unfortunately this hereditary condition is looked upon as a skeleton in the family cupboard, and our request for permission to take photographs of it was refused.

Appended is a full genealogy of the family:

TREATMENT OF SEROUS EFFUSIONS BY INJECTION OF ADRENALIN CHLORIDE.

BY
H. W. PLANT, and PATRICK STEELE,
B.A. Lond., M.R.C.S., L.R.C.P., M.B., Ch.B. Edin.,
House-Physician, House-Physician,
Queen's Hospital, Birmingham.

THIS method of treating serous effusions was first advocated by Barr, of Liverpool, in 1903.

In the first case, one of malignant disease of the pleura with haemorrhagic effusion, he used adrenalin injections empirically, and found the treatment entirely successful as regards the effusion. He then tried it on other cases, both pleural and peritoneal, with almost invariable success even in a case of pericarditis with effusion. In his pamphlet he states that the results obtained in cases of ascites from hepatic cirrhosis were not quite so good as in those resulting from tuberculous peritonitis and malignant growth. The only cases of ascites, with one exception, in which we have tried adrenalin have been those due to cirrhosis of the liver, and without exception the treatment has proved successful. In only one case have we had to inject the adrenalin more than twice, and in the majority of our cases one injection has proved sufficient.

In all cases in which we have tried the effects of the injection of adrenalin the following has been the method adopted:—As much as possible of the fluid was withdrawn by a two-way trochar and cannula, and through the cannula, still *in situ*, 1 drachm of adrenalin chloride (1 in 1,000), diluted to $\frac{1}{2}$ oz. with sterile water, was introduced by means of an exploring syringe. The cannula was then removed, the wound closed with wool and collodion, and, in abdominal cases, the abdomen was gently manipulated for five minutes and a binder firmly applied.

Appended is a summary of the cases in which we have tried this method:

Cirrhosis of Liver.

CASE I.—G. K., aged 54, wireworker. Admitted July 11th, 1904. Complaint, abdominal pain and swelling. Abdomen greatly distended and giving all the usual signs of fluid. There was an umbilical hernia, fairly easily reducible. Paracentesis abdominis was performed on the following dates:

July 14th. 20 pints drawn off: specific gravity 1009.

August 3rd. 18 pints drawn off; 1 drachm of 1 in 1,000 solution of adrenalin chloride, diluted to $\frac{1}{2}$ oz. with water, was injected into the peritoneal cavity.

Patient was discharged on September 7th with no ascites. Three days later was operated on for a strangulated umbilical hernia. No fluid was found in the abdomen.

CASE II.—E. D., female, aged 45, housewife. Admitted July 30th, 1904. Complaint, abdominal pain and swelling; abdomen greatly distended with fluid. The liver extended three fingerbreadths below the costal margin, and was hard, smooth, and very tender. Paracentesis abdominis was performed on the following dates:

July 30th. 14 pints drawn off.

August 11th. 15 pints drawn off.

August 18th. 12 pints drawn off.

August 31st. 13 pints drawn off.

September 14th. 10 pints drawn off. Solution of adrenalin chloride, 1 in 1,000, injected into peritoneal cavity, 1 drachm of solution to 1 drachm water.

September 24th. 2 pints 14 oz. Adrenalin chloride in same amount again injected.

Patient discharged on October 10th with no signs of ascites. Re-admitted on November 26th with fresh swelling. Paracentesis performed on December 3rd, and 8 pints 10 oz. removed. Adrenalin again injected in same amount. Patient was discharged on January 6th, 1905, and has had no further return of the ascites.

CASE III.—A. D., male, aged 41, barman. Admitted August 12th, 1904. Complaint: Abdominal pain and swelling. Abdomen greatly distended, and giving all the usual signs of fluid. Liver not palpable. Paracentesis abdominis was performed on the following dates:

August 13th. 14 pints drawn off. Specific gravity, 1013.

August 25th. 12 pints drawn off. 1 drachm of 1 in 1,000 solution of adrenalin chloride to 2 oz. of water injected into peritoneal cavity.

September 10th. 17 pints drawn off. Adrenalin in same amount again injected.

September 30th. 12½ pints drawn off. Adrenalin injected in same amount.

October 20th. 5½ pints drawn off. Adrenalin 1 drachm to water $\frac{1}{2}$ oz. injected.

Patient was discharged on November 11th with slight ascites, which had disappeared four days later, and has not again returned.

CASE IV.—A. M., female, aged 35, housewife. Admitted September 28th, 1904. Complaint, swollen abdomen and large glands in neck. Abdomen was greatly distended, and gave the usual signs of fluid. Paracentesis abdominis was performed on the following dates:

September 28th. 15½ pints drawn off; specific gravity, 1020.

October 17th. 5 pints drawn off; 1 drachm of 1 in 1,000 solution of adrenalin chloride to $\frac{1}{2}$ oz. of water was injected into the peritoneal cavity.

Patient was discharged on November 11th, with no ascites, and there has been no recurrence since.

Pleural Effusion.

CASE V.—G. B., male, aged 46, labourer. Admitted December 13th, 1904. Complaint, severe cough with shortness of breath and pain in the side during the last six months. On admission he showed signs of extensive right-sided pleurisy, with effusion. The right pleural cavity was tapped, and 55 oz. of clear, serous fluid was drawn off. Patient improved, and was discharged on February 2nd, 1905.

Readmitted on March 8th, 1905, with further signs of pleural effusion. Was again tapped, and 29 oz. of fluid removed. 1 drachm of adrenalin chloride (1 in 1,000) to 2 drachms of water were injected into the pleural cavity.

The patient was discharged on March 23rd, and has had no return of the effusion.

CASE VI.—A. L., male, aged 22, admitted suffering from stab wound of left chest. A week after admission the injured side showed signs of a large pleural effusion. This was tapped, and 1 drachm of the adrenalin chloride solution was injected. Since this time there has been no sign of the fluid recurring.

Cirrhosis of Liver and Oesophageal Stricture.

CASE VII.—A. F., male, aged 46, brassworker, admitted January 13th, 1905. Complaint, abdominal pain and swelling. On admission abdomen was greatly distended with fluid; liver palpable, hard and smooth. Paracentesis abdominis was performed on the following dates:

January 19th. 22 pints drawn off; specific gravity, 1010; 1 drachm of 1 in 1,000 solution of adrenalin chloride with $\frac{1}{2}$ oz. of water was injected into the peritoneal cavity.

Feb. 26th. 9 pints drawn off. Adrenalin injected as before. Fluid did not recur. Patient died on March 27th from malignant cachexia.

Post-mortem Appearances.

On opening abdomen no fluid was found. The viscera were matted together by fairly recent adhesions, except in lower half of abdomen—that is, below the level of the umbilicus. The peritoneum was thickened and in most places congested. In upper part the omentum was rolled up and adherent to the diaphragm, liver, and stomach. The liver was generally adherent to surrounding structures by fairly recent adhesions.

Microscopically: Liver—Peritoneal Margin.

Peritoneum showed numerous flocculent deposits of fibrin on outer surface. The peritoneum itself was thickened, and showed lamellae of fibrous tissue. In the deeper parts of the peritoneum there were a good number of leucocytes, and in between peritoneum and liver there was a zone crowded with leucocytes, apparently polymorphs.

Intestine—Peritoneal Margin.

1. Layer of almost amorphous tissue with faintly fibrous structure looking fringed at edges as if torn away from adherent surface.

2. Peritoneum a good deal thickened and fibrous-looking, with numerous spindle-shaped cells, and in deeper layers a few leucocytes appearing.

3. Intestine with outer layers crowded with leucocytes. Capillaries apparently showing little change either as regards thickening of the walls or obliteration of lumen.

Immediately after the injection in ascitic cases the patients often complained of sharp abdominal pain. In all cases there was a rise of from $1\frac{1}{2}^{\circ}$ to 2° of temperature occurring usually within half an hour of the injection being made, also an immediate rise in the pulse tension was noticed lasting from quarter to half an hour.

In no case was the amount of urine altered.

The reason why the adrenalin should have the effect of stopping the serous exudate seems rather doubtful. In a case of carcinoma of the liver, in which adrenalin was used to check the effusion, from which the patient died some five weeks after the injection had been made, numerous recent adhesions between the visceral and parietal peritoneum were found *post mortem* as well as a flaky deposit of lymph all over the peritoneal surface.

These adhesions were very exceptionally vascular, a regular network of fair-sized vessels radiating out on both sides of the adhesions. Judging from this it seems reasonable to suppose that the adrenalin, by inducing adhesions between the parietal and visceral layers of the peritoneum, and these adhesions becoming vascular, and thus setting up a very fair collateral circulation, should have much the same effect as the transplantation of a piece of omentum under the abdominal muscles by relieving the congestion and so diminishing the exudation.

We have found that the addition of a few minims of the adrenalin solution to a test tube of the fluid exudate has the effect of immediately throwing down irregularly-shaped flakes of lymph. This fact may possibly have some bearing on the checking of pleural effusions.

Take, for example, a case of pleurisy with effusion: after tapping, the separated pleural surfaces come into fairly close apposition, merely being separated by a thin layer of fluid which had not been drawn off. Supposing, then, that no further exudate was to take place, in course of time the fluid would coagulate, and glue the pleural surfaces together. On the other hand, suppose more exudation was to occur, if there had not been time for adhesions to form, the surfaces would again be separated, and the patient be in the same condition as before.

Now suppose that, after tapping, adrenalin had been injected into the pleural cavity; the thin layer of fluid would very quickly coagulate, and adhesions form before more exudation had time to take place, thus obliterating the pleural cavity in whole or in part, so that further fluid could not accumulate. This could hardly take place in the peritoneal cavity on account of its extreme complexity, but it does not seem outside the limits of possibility in the chest.

In any case, however, the drug acts, the injection of adrenalin chloride seems strongly indicated in all cases of serous effusion when simple tapping does not effect a cure.

For the use of the notes of these cases we are indebted to Professors Carter and Foxwell, of Birmingham University, and Honorary Physicians to Queen's Hospital, and under whose care the cases were while in hospital.

INTERNATIONAL CONGRESS OF PHYSIOTHERAPY.—As already announced in the BRITISH MEDICAL JOURNAL, the first congress of physiotherapy will be held at Liège on August 12th and three following days. The term "physiotherapy" connotes electrotherapy, kinesiotherapy (which "in the vulgar," as Touchstone says, is the movement cure), the light treatment, the x rays, heat, ærotherapy, hydrotherapy, electro-diagnosis, radio-graphy, etc. The questions proposed for discussion are: 1. The specific indications of the several physiotherapeutic agents. 2. Description of the apparatus and technique required in each case. 3. (a) How university teaching on physiotherapy is given at the present time in the various countries where instruction is given on the subject; (b) how such instruction should be given in medical faculties. 4. The indication of suitable means for the vigorous repression of quackery and the abuses caused by "healers" who pretend to treat by physiotherapeutic procedures. Papers should be sent to Dr. Gunzburg, 7, Rue des Escrimeurs, Antwerp. Other communications should be addressed to Dr. De Munter, 86, Rue Louvrex, Liège.