the difficulties of diagnosis, the danger of disseminating the disease by surgical manipulation, the extent of the radical operation, and the frequency of recurrences . . . radiation therapy . . . is destined to replace largely the surgery of mammary cancer."

TABLE I.—Five-year Results: Breast Cancer. Post-operative X-Ray Treatment (120–140 kV 3 mm. Al Filter). 358 Cases (182 Five-year).

Treatment Commenced	Cases	Alive	Dead	Five-year
1921	6	2	4	0
1922	52	17	35	3
1923	46	21	25	0
1924	31	10	21	1
1925	47	19	28	4
1926	34	12	22	—
1927	37	18	19	—
1928	25	14	11	—
1929	33	26	7	—
1930	33	29	4	—
1931 (half-year)	14	14	0	—
Total	358	182	176	8

Five-year Cases.—Total, 182. Alive, 77; dead, 113; percentage cure, 42. Three-year cure = 47 per cent.

Three-quarters of the patients were at Stage II at operation: some were in Stage III: one-third showed early local recurrences during the x-ray course, most of which regressed completely with high-voltage x-ray or radium treatment.

TABLE II.—Five-year Results: Breast Cancer. Primary Cases (operable and borderline). X-ray and External Radium Treatment. Forty-one Cases (Fifteen operable and borderline Five-year Results.)

Treatment Commenced	X Rays				Radium			
	Cases	Alive	Dead	Five-year	Cases	Alive	Dead	Five-year
1917	1	1	—	1	—	—	—	—
1918	—	—	—	—	—	—	—	—
1919	1	—	1	1	—	—	—	—
1920	—	—	—	—	—	—	—	—
1921	1	—	1**	1	2 (1*)	—	2	1
1922	2	—	2**	—	1	—	1	—
1923	—	—	—	—	2 (1*)	1	1	1
1924	2	—	2	1	2	1	1	1
1925	4	3	1	3	—	—	—	—
1926	4	2	2	—	3 (3*)	—	3	—
1927	3	2	1	—	—	—	—	—
1928	3	2	1	—	—	—	—	—
1929	1	1	—	—	—	—	—	—
1930	3	2	1**	—	1	1	—	—
1931 (half-year)	5	5	—	—	—	—	—	—
Total	30	18	12	7	11	3	8	3

Five-year Cases.—Fifteen operable and borderline cases (ten x-ray, five radium). Ten five-year gave good results (70 per cent. x-ray, 60 per cent. radium = 66 per cent.). (* = Ulcerated inoperable radium cases.)

Of the x-ray cases, one "borderline" is well after fourteen years; three are well at five years; two were recurrent after five years. Three died of intercurrent disease (**), years 1921, 1922, and 1930, of acute pneumonia, acute enteritis, and aortic atheroma: in each case the breast condition was excellent. One case refused further treatment, and has therefore been removed from the list of eleven x-ray five-year cases.

Of the radium cases one is well at seven years (she has had, since this paper was read, interstitial radium for a slowly growing recurrence in the anterior axillary fold), one is well at six years, one was recurrent after five years. In 1924–5 the half-gram of radium was made the nucleus of a radon centre, and mass surface research was therefore discontinued.

REFERENCES

- Bland-Sutton, Sir John: *Tumours, Innocent and Malignant*, seventh edition, 1922, p. 325.
- Cheatle, Lenthal, and Cutler, Max: *Tumours of the Breast*, 1931, p. 294.
- Ewing, James: *Neoplastic Diseases*, third edition, 1928, p. 580.
- Idem: *Memorial Hosp. Rep.*, 1924, p. 283.
- Handley, Sampson: *Cancer of the Breast*, second edition, p. 36.
- Holfelder, Hans: *Brit. Journ. of Radiol.*, January, 1932, p. 39.
- Idem: *Lehrb. d. Strahlenth.*, 1929, Band iv (2), 1097.
- Lee, B. J., and Cornell, N. W.: "Eighty-seven Cases of Primary Operable Cancer of the Breast," *Annals of Surgery*, 1924, lxxx, 400.
- Lee, B. J., and Herendeen, R. E.: "Pre-operative and Post-operative X-ray Treatment," *ibid.*, 1925, lxxxii, 404.
- Lee, B. J.: *International Conference on Cancer*, 1928, p. 131.
- Plahler, G. E., and Perry: *Journ. Amer. Med. Assoc.*, 1930, xciv, 101.
- Webster, Douglas: Medical Research Council Radium Report, 1923, No. 90, p. 8, and years following; *Brit. Journ. Radiol.*, 1926, xxxi, 59; *Lancet*, 1926, i, 431; *British Medical Journal*, 1925, i, 601; *ibid.*, 1927, i, 80; *Lancet*, 1928, ii, 63.
- Westermarck, Nils: *Acta Radiol.*, 1930, xi, Fasc. 1, 1.
- Wintz, Herm: *Brit. Journ. of Radiol.*, 1926, xxxi, 150; *Lehrb. d. Strahlenth.*, 1929, Band iv (2), S. 1007.

ALLERGIC CONDITIONS OF THE NOSE

BY

J. ARNOLD JONES, O.B.E., M.B., F.R.C.S.ED.

SURGEON, ST. JOHN'S EAR AND THROAT HOSPITAL, MANCHESTER;

SURGEON, EAR, NOSE, AND THROAT DEPARTMENT,
ROYAL MANCHESTER CHILDREN'S HOSPITAL

Up to a few years ago those nasal conditions which have been variously termed "vasomotor rhinitis," "spasmodic rhinitis," "paroxysmal rhinorrhoea," "hay fever," etc., were grouped under the heading of "nasal neuroses." Similarly, certain symptoms which were attributable to the lingual tonsil were also classified as neuroses. These conditions are now regarded as allergic in character, and are closely allied to asthma, urticaria, angioneurotic oedema, etc.

THE ALLERGIC STATE

The allergic state is one in which there is an altered reaction to foreign proteins. In the case of the nose and throat these proteins may reach their objective either through the air or through the blood stream, and there are certain areas which seem to be peculiarly sensitive to protein irritation—in the nose, the tubercle of the septum just opposite the anterior end of the middle turbinal, and the lower border of the inferior turbinal; in the throat, the lingual tonsil area at the base of the tongue. The typical nasal symptoms of the allergic state are intermittent profuse watery discharge combined with obstruction. It differs from cerebro-spinal rhinorrhoea in that the discharge is bilateral, contains mucin, stiffens the handkerchief when dried, and does not reduce Fehling's solution. Paroxysmal sneezing frequently, and asthma sometimes, are associated conditions. During an attack the cavernous spaces of the nasal mucosa (especially over the inferior turbinates) become engorged, causing obstruction; the glandular secretion is enormously increased.

HAY FEVER

Perhaps the most common allergic nasal condition is hay fever. It occurs in this country in May and June, and usually lasts for about six weeks. For the rest of the year the patient is free from symptoms. The offending proteins come from the pollen of various grasses and cereals, which stimulate the sensitive nasal areas in pre-disposed persons, producing the well-known symptoms of paroxysmal sneezing, profuse watery discharge, and nasal obstruction, often accompanied by conjunctival irritation and headache.

VASOMOTOR RHINITIS

The condition known as vasomotor rhinitis, or spasmodic rhinorrhoea, produces much the same symptoms as hay fever, but it differs from the latter in that it occurs at all

times of the year, may last for considerable periods continuously, and is due, not to the pollen of grasses, but to many and diverse proteins, which may be conveyed by the air or by the blood stream. As in asthma, urticaria, angioneurotic oedema, and other members of the allergic group, it is the varying reactions to large numbers of proteins on the part of different individuals similarly predisposed that form one of the baffling features of the disease. Thus, a protein or proteins which will cause a vasomotor rhinitis in one predisposed person will have no effect in another, although other varieties of proteins will produce in him exactly the same symptoms as in the first case. Again, an individual may have a vasomotor rhinitis due to a definite protein, and in time become immune to that protein; at the same time he may develop sensitiveness to another variety of protein, so that his symptoms do not abate. The symptoms, then, of a typical vasomotor rhinitis are the same as those of hay fever; but these symptoms vary in prominence and degree in different subjects. Thus, in some cases sneezing and profuse discharge are the prominent symptoms; in others, intermittent nasal obstruction with but little discharge.

A characteristic feature of the nasal obstruction in these cases is its alternating character. At one time one nostril will be completely blocked, the other being comparatively free. At another time the position will be reversed, the free nostril becoming blocked and the occluded one free. Sudden changes of temperature, such as emerging from cold air into a warm room, will initiate an attack.

The intranasal appearances vary. If seen during a typical attack there is much swelling of the mucous membrane, especially over the inferior turbinal, and the nostril is sometimes completely occluded. This swelling is elastic when touched by a probe. It can be temporarily reduced by the application of adrenaline. When seen in between attacks the intranasal appearance may be normal. But in more atypical cases the nasal mucosa has permanently a swollen and sodden appearance, with no evidence of an inflammatory reaction. The secretion in typical cases is clear, and so fluid that it is hardly visible in the nose. In others it is much thicker in character, resembling the unboiled white of egg.

Vasomotor rhinitis is often mistaken for catarrh, and so is treated without avail. In certain cases of nasal obstruction and discharge apparently due to adenoids vasomotor rhinitis is also present, so that after an efficient removal of adenoids the symptoms still persist. This is a comparatively rare occurrence, but in every case of nasal discharge and obstruction which persists in spite of treatment directed to the nasopharynx and nasal accessory sinuses vasomotor rhinitis should be thought of and sought for. It will often furnish a reason for the persistence of symptoms which all ordinary treatment has failed to alleviate. Some patients display a mixed condition, chronic nasal suppuration being the major lesion, but accompanied by a certain amount of vasomotor disturbance; until this latter condition is dealt with symptoms persist. Vasomotor rhinitis is more common than it was thought to be, and in the last few years I have found in it an explanation for many cases of persistent nasal obstruction and discharge—especially in children—which have proved obstinate to ordinary lines of treatment.

THREE MAIN FACTORS OF THE ALLERGIC STATE

Thus it emerges that, so far as our present knowledge goes, three main factors are always present in these allergic conditions: (1) an unknown personal idiosyncrasy sometimes called the exudative diathesis, a diathesis common to such allied conditions as asthma, etc.; (2) a sensitive condition of the nasal mucosa mainly confined to the areas already mentioned; and (3) the irritation of

proteins conveyed to the sensitive areas externally through the air or internally by the blood stream.

Heredity plays an important part, and frequently a family history of the exudative diathesis can be elicited.

Such nasal pathological conditions as polypi, turbinal hypertrophies, and septal spurs and deviations, are sometimes discovered associated with the allergic state, but they form no part of the state itself. The tubercle of the septum—a small mass of adenoid tissue situated on the septum opposite to the anterior end of the inferior turbinal—is not infrequently definitely enlarged, sometimes attaining the size of a bean. I have noticed this enlargement far more frequently in the allergic state than in all other nasal conditions combined.

TREATMENT

Bearing in mind the three main factors present in the nasal allergic state, it will be seen that our efforts at treatment should be directed against these factors.

Exudative Diathesis

So little is known about this that treatment is largely empirical. On the grounds that the condition was a neurosis (whatever that may mean), such drugs as valerian, bromides, valerianate of zinc, etc., have been freely given with no very satisfactory results. Many years ago, under the influence of Richard Lake, I tried calcium lactate in 5 to 15 grain doses three times a day for prolonged periods, and until recently this proved in my hands the best line of treatment to adopt. Although some results were good, there were many failures. Then, on the hypothesis that endocrine disturbances play their part, and observing the value of adrenaline in asthma, I tried the administration of suprarenal-pituitary tablets, with excellent results in a few cases, and none at all in others; but on the whole success was more appreciable than with the calcium lactate treatment. In 1929 Mollison¹ advocated the administration of parathyroid and calcium combined, and this I have found to be the best method of dealing with the unknown personal idiosyncrasy. In my experience over 60 per cent. of patients respond well to this line of treatment. It must be carried out for periods of two or three months at a time. For adults I prescribe parathyroid and calcium tablets—one, three times a day, increasing to two, three times a day, with a little water, a quarter of an hour before meals. Each tablet contains 1/40 grain of desiccated gland and 5 grains of calcium lactate. To this form of treatment children respond especially well.

The Nasal Mucosa

The second factor is a sensitive condition of the nasal mucosa, mainly confined to the region of the tubercles of the septum and the anterior portion of the inferior turbinates. By far the best local treatment is cauterization of these sensitive nasal areas by means of the electrocautery under cocaine anaesthesia. Between 60 and 70 per cent. of patients will respond to this form of treatment, even if given alone. In young children, when cocaine anaesthesia is contraindicated, I content myself with applying a 1 in 40 solution of silver nitrate. In all cases I prescribe an oily nasal spray containing thymol and eucalyptol (1 grain and 1 minim in 1 ounce of parolein), to be used two or three times daily from a nasal atomizer.

Protein Sensitivity

The third factor is the irritation of proteins conveyed to the sensitive nasal areas externally through the air or internally by the blood stream. If, in any individual case, the definite protein or proteins at fault could be recognized, the patient would be relieved of his symptoms by the removal of such proteins. In hay fever it is possible to accomplish this by means of a sea voyage.

But in vasomotor rhinitis so many different proteins may cause trouble that it is, at present, almost impossible to identify them in any individual case. The skin tests may be tried, but they do not cover every possible source. In any case, patients' sensitiveness to various proteins changes from time to time. Attention to diet by preventing the access of offending proteins may relieve the symptoms for a time. Treatment of hay fever by pollantin (Dunbar's antitoxin) has in my hands met with no success, nor has desensitization.

SUMMARY OF TREATMENT

If these allergic conditions are accompanied by other nasal pathological manifestations, they should be suitably dealt with. Occasionally an enlarged middle turbinal will be found pressing against the septum; or, more rarely, the tubercle of the septum will be so large as to form a small tumour on the septum. In these cases surgical intervention is called for. It is now my practice in treating these nasal allergic conditions to combine local and general treatment. In all cases I prescribe the use, two or three times daily, of the oily solution recommended above, and also parathyroid and calcium tablets in doses suitable to the age of the patient. If the intranasal appearances are fairly normal, I await the result of this treatment for two or three months. If any marked intranasal abnormalities are present they are dealt with at once. If the tubercle of the septum is prominent, or if the inferior turbinals are enlarged, I proceed to cauterize at once. At the end of two or three months, if no improvement has taken place, I use the electrocautery to the sensitive areas and change over from the parathyroid and calcium treatment to suprarenal pituitary.

REFERENCE

- ¹ Mollison, W. M.: *British Medical Journal*, 1929, ii, 1052.

THE PROGRESS OF INSULIN DIABETICS ON A LIBERAL CARBOHYDRATE DIET

BY

CHARLES S. D. DON, M.D. ABERD., M.R.C.P. LOND.
HONORARY PHYSICIAN, SALFORD ROYAL HOSPITAL

For many years diabetic diets have been composed with a view to curtailing considerably the carbohydrates and to increasing the fat.

The formulae of Woodyatt and of Wilder are based on this underlying principle. However, Allen¹ has found that fat influences the insulin requirement, and Greenwald² and others have expressed the opinion that it lowers the carbohydrate tolerance. A high carbohydrate diet was advocated by Sansum,³ and at a meeting of the Royal Society of Medicine,⁴ in 1931, Poulton and other speakers were agreed that a higher carbohydrate diet was desirable, though Lawrence stated that, in his experience, insulin reactions, as a result of the increased insulin dosage, were more frequent. Nixon⁵ and Dyke⁶ have had satisfactory results, and Richardson⁷ was able to increase the carbohydrate at the expense of the fat in patients, and even in a case where the carbohydrate was increased from 57 to 150 grams, and the fat reduced from 150 to 57 grams, there was no necessity to increase the insulin dosage. Himsworth⁸ had results of a somewhat similar kind.

THE HIGH CARBOHYDRATE DIET

The diets used with insulin at Salford Royal Hospital have contained a high carbohydrate content for the past six years, the caloric value varying according to the patient's normal weight. A man of average weight receives carbohydrate 165 grams, fat 126, protein 83; but some women receive as little as 110 grams of carbohydrate, and a few men as much as 190 grams. I have had the

opportunity of observing 171 of these cases in the diabetic clinic after their discharge from hospital, for varying periods up to six years; these patients attended about once a month, and they were taught to test their own urines at home for sugar, a procedure which made them keep to their diets to a surprising extent. A record of the weight, urinary sugar, blood sugar, and of any reactions was made at each visit, and the insulin increased or decreased as indicated.

INSULIN DOSAGE

For the purposes of assessing the changes in insulin dosage I have taken first the records of 94 cases, which have apparently co-operated, and have attended for at least one year, and, according to whether the daily dose has had to be increased by 8 or more units, or decreased by 8 or more units, the dose of insulin is considered to have been "increased," "stationary," or "decreased," the comparison being made between the first attendances and the last attendances, be it one year's duration or six years'. Some patients showed large variations during the first few months, yet could be classed as stationary after a year's attendance. Of these 94 cases the dose was stationary in 45, decreased in 24, and increased in 25.

Duncan⁹ observed 64 cases for two years, and 39 showed a decrease in the insulin dosage, 8 showed an increase, and in 17 it was unchanged. I have followed 61 cases for a period of at least two years—in many cases for five or six years, the average being three years. A comparison of their first and last attendances shows that the dose was stationary in 24 cases, decreased in 17, and increased in 20. Of the 17 cases which showed a decrease, in 16 this decrease had already taken place at the end of the first year's treatment, and at the end of the second year all 17 showed a decrease as compared with the first attendances. Compared with the dose at twelve months, a further decrease had only occurred in 3 cases and an actual increase in 1 case, though the dose is still well below that given at the first attendance. Five of these 17 cases attended for four to six years, but in no case had a further alteration of more than 8 units been made in the day's dosage.

Of the 20 cases labelled "increased," this had occurred in only 7 cases at the end of one year, while at the end of two years a further increase of 8 or more units had occurred in 3 of these, but in only 10 cases was there an increase compared with the first attendances, the remaining 10 cases showing the increase in the course of three to six years. There are only 22 cases which have attended for four to six years, and a comparison of the first and last doses shows that an increase of 8 or more units has occurred in 12, a decrease in 5, while in 5 cases the dose was stationary. I realize that reductions or increases in diet, which patients might make without my knowledge, and other variations (Rabinowitch¹⁰), may account for all these changes in the dose of insulin.

It was possible in many cases to reduce the injections to once daily, yet in only 19 of the 171 cases which attended the clinic was it possible to stop insulin, and in 8 of these the injections had to be restarted later owing to the reappearance of urinary sugar, but 11 have remained sugar-free up to their last visit. These 11 patients are all over 48 years of age, and the average time before insulin was stopped was six months, in 3 cases the period being one to one and a half years. They were not severe cases, the worst receiving 36 units daily at the start, the average being 20 units. I know of only one patient in the clinic who has been able to stop insulin and resume a normal diet without glycosuria reappearing; this patient gradually developed cirrhosis of the liver and ascites. Other patients may have been able to stop insulin and resume a normal diet, but simply ceased to attend.