exactly the same anti-galactan specificity [8]. The typical and characteristic anti-galactan specificity may be demonstrated here with the anti-galactan precipitin from *Tridacna maxima* Röding (Fig. 1), Tridacnin. As can be seen, it reacts with galactans from snail albumin glands and eggs, with arabinogalactan from plants, and also with pneumogalactan of vertebrate origin. It is obvious that we are dealing with a most interesting group of anti-carbohydrate precipitins. Preliminary experiments [9] with *Axinella* and mouse myeloma proteins demonstrate that they are – although of different origin – reacting in a very similar manner with galactans from different sources, obviously because they have more or less identical combining specificities. Full details of the experiments are soon to be reported in another context [9].

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Depression of Thomsen-Friedenreich (Anti-T) Antibody in Humans with Breast Carcinoma

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We have reported the presence of unmasked, reactive T antigen, which is a precursor antigen in the biosynthetic pathway of the human blood group MN antigens [1–6], in cell-membrane preparations of malignant breast glands of humans and Ha as well as St sublines of the TA3 mouse mammary adenocarcinoma [7–12]. Unmasked T antigen does not occur in benign nor in fetal tissues [13, 14].

All humans possess antibodies against T antigen [13, 1, 2, 4] which are likely to be stimulated by an individual's own intestinal flora [8, 15]. Anti-T antibodies in the presence of complement kill the TA3 mouse mammary adenocarcinoma [10, 16, 17].

Anti-T titer scores in the sera of many breast-cancer patients showed no difference from the average normal titer score of 23–24 (Springer, Desai and Tegtmeyer: in preparation). Nevertheless, we observed among breast-carcinoma patients a severely depressed anti-T titer score more frequently than in a comparable group of control individuals [7, 8]. We have now bled 720 consecutive persons gathered from operating schedules and some healthy hospital personnel and studied the incidence of breast and other carcinomata among those whose sera had anti-T titer scores of 12 or less by χ^2 analyses. Blood was collected immediately before or after operation, where applicable, by numerous individuals. The clotted bloods were coded and recorded by an individual who was not involved in the serological assays. Sera were separated from cells and stored in small aliquots at −20 °C unless used at once. Serological tests were performed on all coded samples and independent interpretation was by at least 2 workers and checked by a third. None of those who performed the assays were familiar with the clinical diagnosis or treatment of the persons under study. Titrations and interpretations of titer scores were performed as described previously [8]; 3 standards were included in each test. The specimens were decoded several weeks after performance and evaluation of the tests. Subsequently 3 patients, 1 with and 2 without cancer who had been on oral antibiotics for >5 days were excluded from the study because of the antibiotics effect on the intestinal flora.

The results are shown in Table 1; of 189 breast-carcinoma patients tested, 21.16% or 40 persons had a significantly depressed anti-T titer score of 10 or less ($P = < 0.05$) when compared to 270 patients with fibrocystic disease, fibroadenoma or sclerosis of the breast; when compared to all 470 persons studied who had no carcinoma, P was < 0.001. Titer scores of 12 or < were given by 32.28% or 61 of 189 breast-cancer patients as compared to 8.15% = 22 of 270 patients with breast diseases other than cancer. There was thus a significant difference between anti-T titer scores of these 2 groups ($P = < 0.05$); a P value of < 0.02 was found when breast-carcinoma patients with score of 12 or less were compared with all 470 control persons without carcinoma. Of the sera from the 61 patients in this study with carcinomata other than those or the breast, 9 (14.75%) had an anti-T score of 10 or less and 22 (36.07%) of 12 or less. When compared to the non-carcinomatous control population (B) listed in Table 1, P was < 0.02 for both titer scores of this comparatively small group of carcinoma patients. This latter observation indicates that epithelial cancers other than those of the breast also possess T antigen. All individuals with severely depressed anti-T had normal IgG, IgA and IgM values in their sera. It is reasonable to assume that the depressed anti-T is due to binding of anti-T to breast-cancer cell membranes and released cancer membrane antigens [11, 12, 18]. There may be a depression of anti-T antibody

Table 1. Anti-T agglutinin titer score[a] in patients with breast disease and control hospital population

	Individuals with score			
	10 or <		12 or <	
	[%]	No. of persons	[%]	No. of persons
Breast carcinoma	21.16[b]	40/189	32.28[c]	61/189
Benign breast disease (A)	5.19	14/270	8.15	22/270
All non-carcinomatous persons studied (B)	3.62	17/470	8.30	39/470

[a] Standards: 3 pools of 36–1000 each, arithmetic average titer score 23–24.
[b] P: that difference between anti-T scores of breast-carcinoma patients and controls due to chance is < 0.05 for control group (A) and < 0.001 for control group (B) (see text).
[c] $P = < 0.05$ when compared to control group (A) and < 0.02 for control group (B) (see text).

Table 2. Distribution of severely depressed anti-T titer scores[a] among 189 successive breast-carcinoma patients and 470 successive non-carcinoma control hospital population

	10 or <	12 or <
Breast cancer	85.39%	79.55%
Control population	14.61%	20.45%

[a] Normal average score 23–24.

formation which is associated with the development of breast cancer.

Table 2 indicates that severely depressed anti-T titer scores may be a useful diagnostic aid in patients who are suspected of having breast carcinomata. We are at present refining this rather crude test and evaluating its usefulness as an aid to determine prognosis and therapeutic success in relation to breast cancer.

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Buchbesprechungen

H.G.J. Moseley. The Life and Letters of an English Physicist, 1887–1915. By J.H. Heilbron. London: Univ. of California Press 1974. 312 pp., £7.50.

Nur wenige heutige Physiker erinnern sich noch persönlich an die Aufsehen erregende Entdeckung des Moseleyschen Gesetzes (1913): Die Quadratwurzel aus der Frequenz der Röntgenspektrallinien eines Elements ist eine lineare Funktion seiner Ordnungszahl. Es war bedeutungsvoll für die Bohrsche Atomtheorie und erlaubte die Bestimmung der Ordnungszahl. Moseley, am 23.11.1887 geboren, fiel am 10.8.1915 auf Gallipoli in den Kämpfen um die Dardanellen, „the most promising of all the English physicists of his generation". Das Buch liefert eine gute Darstellung der Persönlichkeit und der Arbeit Moseleys und zugleich interessante Einblicke in die damalige physikalische Forschung in England und auf dem Kontinent. Von den beigefügten 145 Briefen sind die meisten an die Mutter oder die Schwester Moseleys gerichtet; dazu kommt der Briefwechsel mit Rutherford, Bohr, Hevesy, Bragg, Fajans u.a.

E. Lamla (Göttingen)

Wege und Ziele der Physik. Von S. Flügge (Verständliche Wissenschaft, Bd. 111). Berlin-Heidelberg-New York: Springer 1974. 135 S., 27 Abb., DM 12,–.

Mit ungefähr gleichem Gewicht, auf je etwa 30 Seiten, werden ohne wesentliche Benutzung mathematischer Formeln behandelt: das Werden des mechanistischen, korpuskularen Naturbildes mit den Begriffen Kraft und Stoff und seine Beibehaltung in der Optik, dann die Loslösung vom stofflichen Äther und von der Fernkraft in der Relativitätstheorie, weiter die Theorie der atomaren Welt auf Grund von Dualität und Unbestimmtheitsbeziehung, schließlich die Vorstellungen und besonders die Erhaltungssätze, mit denen man heute die Hochenergiephysik und die Erscheinungen der Elementarteilchen zu verstehen sucht. Das Vorhaben, den naturwissenschaftlich gebildeten Laien in die Wege und Ziele der Physik und ihre umfassenden Begriffe einzuführen, ist geglückt.

F. Hund (Göttingen)

British Scientific Documentation Services. The British Council: London 1974. 72 pp., £1.

War es ehedem schwierig, sich über neue Publikationen zu informieren, und wurden zu diesem Zweck „Zentralblätter", Referatendienste, geschaffen, so ist es inzwischen offenbar bereits kaum noch möglich, sich auch nur über die bestehenden Referatenorgane auf dem laufenden zu halten. Eines der besten internationalen Hilfsmittel, die Auswertungsliteratur (Sekundär- und Tertiärliteratur) zu finden, ist vermutlich das Werk „Codata" (Springer-Verlag 1969). The British Council legt nun diese Broschüre vor, die zeigt, welche Literaturdienste *in Großbritannien* geschaffen worden sind, welche Aufgaben in welchem Maße sie erfüllen und zu welchem Preis man sie erhalten kann. Daß diese Broschüre bereits wieder ein Inhaltsverzeichnis benötigt (und ein Sachregister), zeigt die schwierige Lage des Publikationswesens.

F. Boschke (Heidelberg)

Society and the Assessment of Technology. By F. Hetman. Paris: OECD 1973. 420 pp., DM 23,80, $9.50.

Kontrolle und Management der Technologie, und daher ihre Bewertung, sind sehr wichtige und vielseitige Aufgaben. Sie dienen sowohl zur Überwachung negativer Nebenwirkungen bereits vorhandener als auch zur Auswahl potentieller Technologien. Dieses Buch behandelt das Problem in seinem sozialen und wirtschaftlichen Rahmen. Es enthält einen Überblick über bisher entwickelte Methoden zur Bewertung der Technologie. Der Autor weist jedoch darauf hin, daß diese alle unvollständig sind, da wegen der Schwierigkeit, die in der Quantifizierung nicht wirtschaftlicher Aspekte (in der Bewertung sozialer Nutzen und Kosten) liegt, nicht alle Aspekte berücksichtigt werden können. Es sei auch bisher noch keinem Land gelungen, Einschätzung und Kontrolle von Technologie voll zu entwickeln.

G. Feichtinger (Wien)

