<<钱临照文集>>

图书基本信息

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前言

钱老离我们而去已经有两年多了，但他的音容笑貌、大师风范已在科大人的心中留下了深深的烙印。
每当走过图书馆前那片郁郁葱葱的树林，竖立其中的钱老铜像，总令人肃然起敬。
他那炯炯有神的目光，仿佛在永久地注视着每一个科大人，催促科大人要不断开拓进取。

钱老1906年8月生于江苏无锡，1929年毕业于上海大同大学，1931年任北平研究院物理所助理研究员，1934年经考试取得庚子赔款第二届公费留学生资格，赴英国伦敦大学留学。
1937年抗日战争爆发后，钱先生当即返回国内，奉命设法将北平研究院物理所的仪器运往昆明，并在迁至昆明的北平研究院物理所从事科研工作。
抗战胜利后，随物理所回迁北平，1947年赴纽约联合国救济总署工作，1948年兼任中央研究院代理总干事，1949年任中国科学院物理所研究员，1955年当选为中国科学院数理化学部委员，1960年调入中国科学技术大学任教，1979年至1984年任中国科学技术大学副校长。

钱老毕生致力于物理学的发展。
1939年在昆明的中国物理学会学术会议上将晶体位错理论在中国作首次公开介绍，为日后在中国推广该理论奠定了基础。
50年代，他设计的高灵敏度拉伸机成为研究金属单晶范性的重要设备。
他完成了锡单晶表面刻度所导致的滑移特征的研究，大大促进了我国固体力学强度的研究。

钱老数十年来与科大的事业休戚与共。
1958年科大建校伊始，就亲自给物理系的学生讲授普通物理学。
1970年，钱老与他挚爱的科大一起从北京迁至安徽，此后一直坚持在校本部工作。
在落户合肥的最初几年里，学校面临着重重困难，钱老总以事在人为的坚定态度勉励广大师生，并以自己的实际行动激励大家共同为办好科大而努力奋斗。
1978年钱老主持制订了全校的物理教学计划，精心挑选教学与科研水平高的教师主讲基础物理课。
他负责重建物理教学研究室，全力支持筹建科大天体物理中心，积极创建结构成分分析中心实验室。

钱老生前一直关注少年班，与少年班结下了不解之缘，深受少年班师生的爱戴。
1978年我校招收首届少年大学生，钱老亲自担任少年班研究组组长。
每逢杨振宁、李政道、丁肇中、吴健雄、陈省身等著名科学家莅临少年班参观，钱老都亲自陪同，少年班成立不久，钱老陪同严济慈校长视察少年班时，曾经语重心长地说：“你们要带好少年班学生。
他们今天是国家的财富，将来是国之栋梁！
”钱老任副校长之后，虽然公务繁忙，仍对少年班工作多有指导。
钱老要求大家要关心和爱护少年班的学生，对外界的宣传也要淡然处之，为这些青少年学生创造一个平静而又宽松的成长环境。
少年班作为新型的办学模式，在20多年的办学实践中取得了很大的成功。
这无疑与钱老的关怀和支持是分不开的。

钱老少承家学，在文史方面打下了坚实的基础。
他在《释墨经中之光学、力学诸条》一文中，站在现代物理学高度，深刻地揭示了这些条目的物理学意义，令英国著名科学史家李约瑟惊叹不已。
解放后，他在科学史研究方面投入了大量的精力。
1980年中国科学史学会成立时，他因为众望所归被推举为首届理事长，为科学史的发展做了大量的组织领导工作。
不仅如此，他还富有远见地把目光投向科学史教育事业的发展。
80年代初，他与王竹溪先生共同担任国务院学位委员会第一届学科评议组物理组组长，率先争取在“物理学”一级学科之下设立了物理学史博士点，开创了我国自行培养科学史博士的历史。
在他的积极支持和直接参与下，科大很快成立了自然科学史研究室，开始招收自然科学史的硕士和博士研究生。
他亲自担任该室第一任主任和研究生导师，从事科学史研究以及研究生的指导工作，为国家培养了大

批科学史人才，使科大成为国内外著名的科学史人才培养基地和国际知名的科学史研究机构。

内容概要

《钱临照文集》一共分为五个大的篇章，第一编主要列举了钱临照先生重要的物理学论文，有的采用英文纪录形式，有的则是运用中文进行解释，站在现代物理学的高度，深刻的揭示了这些条目的物理学意义。
第二编包括专著和科学专论，阐述了晶体中位错理论的基础，固体的性质和它的微观结构以及大学物理实验杂谈等极具科学价值的文章。
第三编是科学史论的著作，涵盖了从古到今世界物理学的发展，例如中国古代光学和力学的知识，中国古代磁学的知识等等。
作者还涉及到了外国的科学技术史，对西方历史上的宇宙理论作出了评述。
第四编属于回忆性文章，对中国的物理学进行了具体的回顾，并对物理学界的老前辈们进行了高度的赞扬。
第五编主要收集了钱老先生的杂文、书评以及序，充分反映了钱老先生的傲然风骨。
本书还特别刊登了钱临照先生的自传，帮助读者们更好的了解这位潜心向学，以良知和良心屹立于世人面前的中国学者。

章节摘录

Discussion The reasons which lead us to consider the surface lines developed by hot sodium vapour as developments of Griffith cracks in the surface may be summarized as follows： The lines are particularly well developed in situations where systematic scratching is extremely improbable, e.g. inside blown glassware and inside drawn tube. In the latter case they run in a direction at right angles to the axis, a direction which is difficult to ascribe to scratches or other marks made during manufacture or cleansing. The lines develop with age, being almost completely absent on glass fresh from drawing at a high tempera-ture, and frequent on the same glass some hours after drawing. They are well developed in hard glasses such as Griffith used in his experiments, and hardly found at all in soft soda glass. In the case of the annealed optical glass the lines form an orthogonal system. In an isotropic material the lines of principal stress form such a system, and it is suggested that the cracks appear in directions normal to the principal stresses （tensions）. The effect of annealing the optical glass should be to release the local stresses, which will be expected to have dif-ferent directions at different points, and in the process of release the cracks appear. It should be mentioned that identical glass bars, which had not been annealed, showed no surface cracks. In this connexion the effect of a scratch is of interest. A piece of plate glass exposed to sodium vapour showed no typical Griffith cracks. A fine diamond scratch was then made on another specimen from the same piece. Etching revealed typical cracks running out on both sides from the scratch, in directions approximately normal to its length （Fig. 18）. At a free edge the principal stresses at any point must be parallel to the edge, so that we should expect this behaviour if the cracks are caused by a principal stress, and arise in a direction normal to it. It does not, of course, follow that in this case the principal stress is everywhere a tension parallel to the edge： there may well be some kind of periodic alternation of tension and com-pression, the cracks appearing in the localities of tension. The function of the crack is to liberate the local stresses. The circumferential direction of the cracks in glass tubing is a further confirmation of the hypothesis that they are normal to the predominant principal tension, which, from the process of manufacture of the tube, must be axial. The nature of the attack by the sodium vapour has not been studied. With pyrex glass there is always a slight brownish discoloration of the sur-face after etching; with soft soda glass the brown discoloration is much more marked. The quartz glass surface has a milky appearance. The pref-erential attack along the cracks, which are probably only a few molecules wide in the original state, can be attributed to the increased free local field at a sharp rectangular edge, as considered by Kossel in his work on crystal-lization. It is easier to remove an atom or molecule from an edge than from a surface. The whole question of etching by chemical attack is a complicat-ed one on which little has been done. Hausser （1927, 1928）, for instance, has pointed out that with metals different crystallographic faces of the same crystal can be developed by different etching agents （Hausser and Scholz 1927）. It is hoped to investigate whether the lines of principal stress associat-ed with arbitrary externally applied stresses can be developed on optical glass by the method here described. Other frequencies besides fl and f2 have also been excited in circuitswhich were somewhat regenerative, such as （b） and （c） in Fig. 2. In cir-cuit （b） the quartz cylinder in series with a high-frequency milliammeter isconnected between the grid and the plate and a sensitizing coil~8~ L is add-ed between the grid and the filament. When the frequency of the circuit istuned to that of the quartz cylinder, the latter will be set into vigorous os-cillation, as shown by a sudden rise in the indication of the milliammeter.In circuit （c）, a single coil is used and the grid excitation is obtained by atap on this coil; this is, in principle, analogous to the ordinary self-con-trolled Hartley circuit. The quartz cylinder in this circuit is inserted in se-ries with the grid. As the capacitance is increased from a small value, apoint is reached at which the system starts oscillating. The oscillations areweak at first, but they become stronger and stronger as the capacitance isincreased, and reach a maximum amplitude at a value of C just below thatwhich makes the natural frequency of the LC circuit equal to the naturalfrequency of the quartz. Past this point the amplitude of the scillations decreases, and a further increase of C will cause the oscillations to topsuddenly. The frequency in both arrangements （b） and （c） is nearly equalto the natural frequency of vibration of the quartz and varies very littlewith the condenser setting. We obtained two additional fundamental frequencies of a hollowquartz cylinder with the arrangement（c）, designated by f3 and f5 in Table t and three additional fundamental frequencies with the arrangement（b）,designated by f3, f4 and fs, besides the frequencies f~ and f2 obtained withthe Pierce circuit. Two of these frequencies f3 and f4 depend only upon thelength of the cylinder, and are independent of its cross section. They willbe shown to correspond respectively to torsional and longitudinal vibra-tions. The other frequency fs is probably of transverse vibration.